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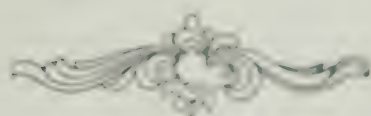
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“ Good teeth at fifty proclaim
family character, conserve
facial contour, and insure
food comfort. ”





CHARLES F. ASH, D.D.S.
New York City

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, JANUARY, 1916

No. 1

Removable Bridgework on Non-Vital Abutments.*

CHARLES F. ASH, NEW YORK CITY.

WHAT procedure we shall follow in making a restoration by means of bridge is a subject not to be considered lightly.

Every operator should base his prognosis on the question, "How can I give my patient the best possible service?" There are so many elements that may be involved in this question that it is almost impossible to enumerate them all—the ability of the operator, the general condition of the mouth as to pyorrhea, the possibility of keeping the mouth clean after the bridge is made, efficiency in mastication, durability of the abutments, health of the patient.

Let us assume for the sake of argument that no septic conditions

[In a letter to ORAL HEALTH, Dr. Ash states that the Technique advocated by the author before the Central Dental Association of New Jersey in November, 1911, and published at that time in ITEMS OF INTEREST, is more or less obsolete for the reason that the Hinge Joint attachment is no longer used. Members of the profession will be glad to learn that Dr. Ash's more recent technique will be published in the near future, he having consented to present a paper upon the subject before the second district Dental Society, New York.—EDITOR.]

* Read before the Toronto Dental Society, November, 1915.

will *ever* occur at the apex of a devitalized tooth, and that a dead tooth is just as good as a live one.

Now let us ask ourselves—Is a fixed bridge as good as a removeable one? I will grant, if you please, that the masticating efficiency of one is as good as the other. Very well, so far there is no difference.

The next question is: Can a fixed bridge be kept as clean as a removeable bridge? No intelligent layman would say yes; and certainly no intelligent dentist would claim that it could. Very well, then let us ask: Is cleanliness an important or desirable factor? Let me answer this by quoting from Dr. Henry Gillett's discussion of Dr. Schamberg's paper on "Dentistry, a Blessing or Curse."

October 4, 1915.

HENRY W. GILLETT, D.M.D.

(Discussion of Dr. Schamberg's Paper.)

"Hunter's indictment of septic dentistry came none too soon, nor was it too severe. Out of it grew a vast amount of explanation on our part that failed to explain. We called loudly for more co-operation by medical men, we pointed out their neglect of the mouth, and cited in triumph our fixed bridge work cases that had been successful in spite of their defects, and we laid it all on the other fellow.

Fortunately, we did something more. Here and there among us men began scrutinizing methods, processes and results. Observation, comparison, consultation with general practitioners bore fruit.

More and more men are realizing that only after careful diagnosis of all the conditions of a given mouth, and consideration of its relation to the rest of the organism, may they safely attempt dental treatment. More and more dental practitioners are realizing that if they advise, assent to, permit or fail to condemn the retention of septic foci in the mouth, they are morally responsible for the health and lives of their patients.

I dislike to contemplate what may be the legal responsibility of the practitioner who thus fails.

Lest I generalize too much, and so fail to make myself clear, I will mention certain specific details of diagnosis and procedure. The universal experience of men who have used radiography in all their root canal work for even one month, is that they no longer dare to do root canal work without its assistance, as they might incur responsibilities that no careful man would wish to carry.

Especially do we need better diagnosis in our daily work—earlier recognition of gingival irritation. We have recently been saddened by the loss from our ranks of the ablest scientist dentistry has ever known, Dr. Greene Vardimn Black. I am filled with gratitude that he was spared to complete his "Special Dental Pathology," published last spring. If every practitioner in this room would read, digest and apply the principles he enunciates, for the care and protection of gingivae, it would roll up such a record of achievement in

preventive medicine as to be an unequalled monument of his life work.

My remark concerning fixed bridge work will arouse deep opposition in the minds of some of you. To those I make this challenge—take the May, 1915, number of "Items of Interest" and study the articles on prophylaxis until you think you know what those writers mean by a clean, healthy mouth, then go to one of them and let him show you just what he really does mean. Then observe, as they come to you, the mouths of your patients (your own and others) wearing fixed bridge work. When you have done this conscientiously for six months or a year, I challenge you to report the percentage of cases where the gingival tissues, adjacent to fixed bridge work, in position one year or more, are in a satisfactory state of health. I greatly doubt if you will report one per cent. of such cases in those bridges supplying more than one tooth, with the possible exception of so-called "wash bridges."

It is to be regretted that many who are skilled in mechanical technique are unfortunate in their inability to realize the exacting details and constant alertness necessary to insure asepsis. Successful root canal work calls for exactness in all details—none can be neglected.

A.—Any man who is to-day doing his root canal work under a technique, which he would regard as insufficient for a laparotomy case, should re-adjust it until it will meet that test before he touches another such case."

It seems almost silly to take up our valuable time in discussing the relative merits of a clean and an unclean piece of work in the mouth, but so many unclean—yes, filthy pieces of work are being carried in the mouths of patients to-day, and so many more being inserted every day that it is impossible to let off the dentists who are doing it on any lighter charge than ignorance or indifference—and either of these is criminal.

A patient recently presented himself in my office with a fixed bridge, and asked me to remove, repair and replace it. I asked him if he was careful about cleaning his teeth, and he almost indignantly replied that he brushed them three times a day, and had just cleaned them prior to coming to my office. I removed the bridge, and holding it with finger and thumb before the patient, turned it about so that he might see it, and then asked him to take it in his hand. He replied that he didn't want to—"and yet," I said, "you would keep in your mouth a thing so filthy that you refuse to even hold it in your hand." He said he had no idea that it was in such a condition, and promptly accused the man who made it of malpractice. And, gentlemen, the serious thing about this is that the charge was not without some foundation. Needless to say, he is now wearing a removable bridge.

The durability of the abutments may be appropriately discussed at this point. It requires no argument to prove that other things

being equal, an abutment which can be kept clean will last longer than one which cannot be kept clean.

If this is true in the average healthy mouth, it is imperatively true in a mouth predisposed to pyorrhea.

Note A.—It may be laid down as a definite rule that in proportion as a mouth is predisposed to pyorrhea, just in that proportion is it necessary for the patient to have a piece of bridge work which can be readily removed and cleansed by him, and not only must it be able to be removed and cleansed, but the abutment remaining in the mouth must be so constructed that there shall be no projection beyond the line of what would be the natural contour of the teeth, to catch and hold food pabulum and other debris.

We might advance further arguments, but sufficient has been shown to prove that other things being equal, a removeable bridge is more desirable than one that is fixed, and the fact that we have all seen fixed bridges which have been worn for ten or fifteen or twenty years does not in any degree lessen the force of the argument in favor of removeable work. Taking the stand then that removeable bridge work is more desirable than fixed bridge work, let us ask: Can as strong an abutment be made on a live tooth as on a dead tooth? For my part I have never yet seen the case where it has, nor can I conceive the possibility of such a thing.

The advocate of the live tooth abutment immediately retorts that the assumption that a dead tooth is as good as a live one is a fallacy, and points for his proof to the startling number of devitalized teeth with imperfectly filled roots which show blind abscesses at their apices.

Note B.—I might reply by pointing to the startling number of dead teeth having blind abscesses or fistulous abscesses and carrying abutments which were placed there when these teeth were alive. And a still greater number of these teeth, carrying single crowns, which fit so imperfectly at the gingivae as to cause inflammation and suppuration. If your Society has good luck, I trust that some one, before the season is over, will show you the pathological changes which take place in a vital tooth when used as an abutment.

This immediately raises the question: Can teeth be devitalized and their roots so filled as to preclude the possibility of sepsis resulting therefrom? I am ready to assert most emphatically that they can. I grant you that the technique heretofore followed and unfortunately still practised by the great majority of dentists will not insure against resulting sepsis. But that is the fault of the operator. It means, too, that a radical change must take place in the teaching as well as the practice of root filling.

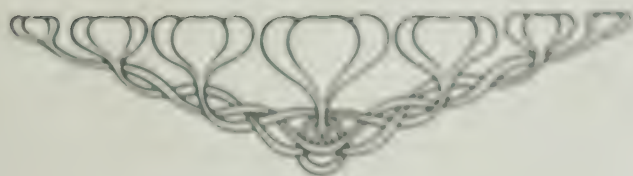
I will presently put on some lantern slides to show you that these roots can be filled, and if roots as difficult as these which I shall show can be perfectly filled, it is obvious that almost any other root can be perfectly filled. I do not make the assertion that every man can fill roots with this degree of perfection. Indeed, I am very sure that only

a limited few have at present the proper technique at their command to make this possible. And of these who have the technique, there are fewer still who have had sufficient experience so that they get 100% perfect root fillings; but I do say that this work can be properly and perfectly done.

Let us not condemn a method because there are but few men capable of practising it if the results of that method may be shown to be better than some other existing method. But let us encourage a high ideal in the minds of the profession at large and a desire to improve their technique to the point where these ideals may be made possible of accomplishment for them.

One part of this subject so intimately involves another that one is almost tempted to go on indefinitely touching on various phases of the subject. But I must mention at this point the necessity for a man recognizing his own limitations and giving his patients such service as lies within his own ability. No man should attempt a piece of work which he knows to be entirely beyond his skill, and if such a piece of work is required by his patient, then the patient should be referred to somebody who is able to properly perform the service required.

It is easily possible for a man contemplating the use of certain teeth as abutments to first radiograph such teeth, and he can probably then determine whether the filling of the roots is likely to be an operation which shall come within the scope of his ability. If he should find that the required operation is beyond his skill, he should either refer the patient for the root canal work to some one who can do it properly, or else resort to some other form of restoration.



Buffalo Letter.

BY HABEC.

WHEN LEUMAN CAME TO TOWN.

NOW Leuman Waugh, of great renown, came to our burg from New York town and talked the wee' sma' hours away upon the subject of X-ray. With flow of language like the brook and bait as fine as any hook that ever tempted wig'ly tribe to leave the deep where they abide, he told us in his way of ways the great importance that it plays in telling us the naked truth unless we go amiss, forsooth, and see the things that are not there or fail to read with proper care and mix the diagnosis up like oil and water in a cup and put your treatment to the bad because you were so sure you had the radiograph to prove it true instead of being up to you.

Just where a fellow gets in wrong is when he puts dependence strong in what he thinks he's sure he sees and has a hunch that he's the cheese. He needs a course or two or three in scientific radiography before he should attempt to tell by sense of touch or sight or smell what means the signs that he beholds of human weakness it unfolds. If with each X-ray outfit bought the dentist should be duly taught just how the gosh durned thing should work, and put him next to every quirk, he'd stand a chance to make it go as well as bring him in some dough, and not a means of cheap John bunk that finishes in first-class junk. A school of radiography is just a plain necessity, and not until it's brought about should every dental roustabout, like Habec and some friends of his whose knowledge wouldn't stand a quiz, be given such a chance to bust a thing you buy on face and trust.

But you should have heard our Leuman with acumen great illumine a topic of profound interest to every up-to-date dentist. From nine p.m. till one he speiled until our brains with knowledge reeled, and we were loaded to the brim with a desire to be like him and have an outfit by the chair to beard the abscess in its lair and to the cringing victim show, as we observe the telling blow, the inner secrets of his life and see how little bugs in strife have eaten holes into his jaw enforcing pathologic law. The awful tale is not half told, sufficient that they should behold the havoc wrought by cocci, germs and diplo, micro, staphlo worms possessed of zoologic terms that thrive in darkness, dampness, filth and dig away with startling stealth until they spread and radiate from wisdom tooth to orbit plate. Small wonder that the victim stare and offer up a silent prayer, for ills of lesser consequence have sent strong men from thither thence.

Caught like the spider in the web, no chance has he the mesh to shed and to the dentist he must turn, at other times whose aid he'd spurn, but now he looms a saviour grand, the greatest man in all the

land. Saint Apolemia be our guide and fill us with our calling's pride, so that deception we disdain and real profess'nal men remain. Advantage thus to take beware, for in it lies a hidden snare, and should he hark to avarice he spoils his chance of future bliss.

But with a history of each case and common sense to keep apace, an X-ray picture may be seen to throw the truth upon the screen, and banish every bit of doubt by putting strepto to the rout. And of the great and Holy Writ oftimes we'er obliged to admit that one can find within its text the words to cover each pretext according to his own desire his every motive to inspire. 'Tis thus we find the X-ray guide will make it plain or likewise hide the truth or falsehood as you will, and thereby fill your golden till, or be an instrument of good as every great discovery should.

The wonders of this marvelous boon as yet 'tis far too soon to comprehend its worth or foretell all its birth shall mean to myriads unborn and e'en to those of hope forlorn. All this our Leuman did explain in graphic words and reasons sane, and when the owl clerk turned us out every shadow of a doubt amongst the faithful sitters there had disappeared into thin air, and Billy Sunday would be glad if converts in proportion had hit the fragrant sawdust trail when Leuman ended that great tale.

Sometimes we meet with men well versed, perhaps with too much knowledge cursed, on subjects that to us are vague, and make themselves an awful plague because they think they know it all from referendum to recall. Not so with Leuman be assured, for all his thoughts are well inured, so that expression is an art and every sentence plays its part. Few men can boast of such a gift, well fortified by telling thrift, and with a presence great though small, rotund shortness that seems tall, he holds his hearers in a thrall and throws about a mystic pall in which they revel in content until the theme is well spent.

'Twas thus the evening slipped away, and truth we say it to this day, a pleasanter we never spent, though off to sleep my right hand went without respect or sense or tact snored blithely through convincing fact. Why waste your time in telling more and prove yourself a blawsted bore, for didn't Leuman up and go by T.H.B. to Toronto and spiel it all to you again with wondrous skill and arm-men? Though neutral when it comes to war, not so when Leuman's at the bar, so don't attempt to make a fuss, 'rah for old Buffalo, he's one of us.

THIS IS ON US

Habec has had palaver, compliments, soft soaps, jolly and sally given him on the one hand, and censure, obloquy, anathemas, imprecations and execrations hurled at him on the other hand, and they have never penetrated beyond the epidermal layer, but the compositor on ORAL HEALTH gave him an awful jar in making up his letter for the November issue.

How would you like a headline like this?

By Habec
The Inevitable.

We wouldn't mind being called The Invincible, The Impossible, or even The Irrepressible, but The Inevitable positively is the limit. To make matters worse, the editor didn't even apologize or send a Henry Ford expedition with a substantial peace offering. Possibly he may have intended it as a compliment, but we fail to view it from that standpoint. Yet, how easily all this injury to Habec's pride might have been avoided. Just a little more space between the lines, with a long dash to emphasize the separation, would have saved Habec an infinite number of heartaches and despondent hours.

As an epitaph on the slab marking the lonely spot where we anticipate spending much of our future unoccupied time, it might make quite a hit with the relieved relatives, but while the little red corpuscles are still playing tag from pole to pole at the rate of two minutes per lap, within the sacred precincts of our cutaneous covering, we refuse to be The Inevitable. However, we forgive Wallace this time, but herewith serve him with the warning that should it happen again we shall demand that our salary be doubled as the only commensurate balm to our ravished feelings. Perhaps, on second thought, we would not deplore a repetition, as we have successfully retained intact the one goose egg already received in exchange for our numerous intellectual outbursts, and a congenial consort no doubt would serve to make G. E. No. 1 more contented with its lots. And then—happy thought—we might awaken some bright morning to find a brand new family of little G. E.'s. After all, in view of such glowing prospects, we have decided that the injury was more imaginary than real, so we withdraw the complaint and apologize to the editor.

HIGHER MATHEMATICS.

Which would you prefer, to take a man at his face value or at the value of his face? It's rather a cheeky proposition and may be viewed from diverse angles, as the photographer might say, but nevertheless there is a thought back of it that may be worth uncovering.

The face value of a man may qualify him for any of the higher stations in life. Should it register below a certain point, he must depend on the value of his face. The face value of a man may be subject to discount, like his note at the bank, or it may draw interest instead. The value of a man's face often places him in his proper environment without effort on his part. Habec once knew a man who took pride in having it said of him that he had the best funeral face in the town, and in consequence he presided with great unction and dignity on the driver's box of the village hearse. A fourth of July celebration or the county fair was always shunted in favor of

the chance to display the value of his face. Sometimes we find a fellow who is two-faced, but this seems to bisect its value rather than double it. At any rate, so long as each has but one poor old mug to trade on, we believe it is better to establish a good face value, and the value of one's face will come tagging after.

A BE OR NOT A BE.

When is a B not a B? Don't jump: you're not stung. It isn't that kind of a B. The one we refer to is harmless and a perfect gentleman. For instance, in the word "subtle," it is pronounced "sut'l." Now, what is the sense of sticking a B in there to fool a fellow and cause these foolish remarks. There is a lot of the tail-wagging the dog sort of business in orthography, and we begin to feel the symptoms of an acute attack of *esparanza*. Aspirin used to be given for such complaints, but now that the Kaiser is taking it all we must suffer in silence.

But speaking of "sut'l," Habec had an X-ray of it sent him from Nebraska the other day. The dentist remarked that it was taken to locate an abscess over one of four teeth, and that the only way he could account for the wire fence in the picture was that the patient was a farmer and he must have been thinking of the hogs. The teeth were so sut'l as to be invisible, and the whole thing looked as though the expert radiographer had taken the farmer's whiskers instead of his teeth, for it showed only a maze of scraggly lines running in all directions. Surely the mysteries of the X-ray are past finding out.

THE LURE OF BOYHOOD.

At last Frank Dayment has yielded to the unseen power of boyhood's lure and has returned to Toronto to practise his profession. He has taken the practice of Dr. George Gow, who is patriotically serving his country at the head of the Canadian Army Dental Corps. He expects to continue the practice during Dr. Gow's enforced absence. We congratulate Toronto in having acquired one of Buffalo's best practitioners, and a royal good fellow in every respect. Habec had the satisfaction of enjoying Dr. Dayment's friendship, and feels a great personal loss in being deprived of almost daily enjoyment of this privilege. He was a member of the Dental Advisory Board of the Department of Health of Buffalo, and was very active in the management of our free dental clinics, and we shall miss him as a co-worker. He was an active member of Buffalo's best male vocal society, the Guido Chorus, and filled an enviable social position in our city. He has endeared himself to his patients and enjoyed a large clientele that is loth to part with him. May success attend him.

Best wishes to our readers for 1916

HABEC.

Management of Children and the Treatment of Their Teeth.

CLARENCE R. MINNS, D.D.S., TORONTO, DENTAL DEPARTMENT,
SICK CHILDREN'S HOSPITAL.

IN complying with the request of your worthy editor for an article upon the above subject, I have found it difficult to confine my article to any reasonable length, for this subject is such a large one and one of such great interest to me.

In the first place, to be successful as an operator with children, it is essential for one to love children and have a deep and sincere interest in them and their work, play and thoughts. Besides these two great essentials, he must be possessed of an abundance of patience and kindness. The child must be made to feel that that which is being done for him is for his benefit, and that you have his interests at heart. Therefore, a few minutes spent in explaining the use and the working of various instruments and appliances, as well as in answering the questions of the child with an inquiring mind, is time well spent.

One of the main objects in children's work is to get the best results with the least effort. It is always wise to be frank and honest with the child and never to deceive them. Choose your operations, commencing with a simple one, and one which has little or no pain connected with it, if possible, reserving the more difficult and slightly painful operations for future sittings, when the child will be less nervous and have more confidence in the operator.

[Since the above article was written Dr. Minns has passed over into the Great Beyond. The late Dr. Minns was one of the most promising members of the dental profession. He was head of his class each year of his four-year course at the R. C. D. S., and since graduation was demonstrator at the Royal College of Dental Surgeons and in charge of the Dental work at the Hospital for Sick Children, Toronto. The manuscript was written for "Hya Yaka," the students' journal of the R. C. D. S., to whom ORAL HEALTH extends thanks for courtesy of publication. Clarence Minns was appreciated by the medical staff of the Sick Children's Hospital no less than by his college associates, and will long be remembered for his enthusiastic and keen devotion to every worthy effort for the advancement of his profession and the uplift of mankind. The late Dr. Minns proved to be of almost too fine a mould for this strenuous work-a-day world, and made the mistake of not giving himself the relaxation and rest that his private practice and other activities seemed to demand.—EDITOR.]

Again, it is advisable in most cases to treat the child in the absence of his parents, for with but few exceptions, children are much more easily handled and will stand more when alone with the dentist.

Ascertain upon the first visit of the patient if there has been any toothache. If so, remove the cause and stop the ache, if at all possible. Then proceed with prophylaxis. In case of no pain, I invariably perform prophylaxis as my first operation, thus proving to the child that the dentist is not such a dreadful man as his aunt, his big brother or sister, or some other thoughtless person has pictured him to be. Then, if the child is old enough to understand, explain to him how to properly use a tooth-brush and when to use it. If the child is too young for this, I explain to its mother how she can keep the mouth clean.

The general order of procedure is as follows:

1. Pain.
2. Pus conditions.
3. Vital teeth nearing exposure of pulps.
4. Putrescent conditions.
5. Minor cavities.
6. Extraction.

As a general rule, I leave the extraction till the last sitting, unless some other condition contra indicates this. In fact, for some patients it is much better to get the extraction over at the first sitting, and then, with the most dreaded operation off my hands, I can proceed to repair all other conditions in a clear field devoid of all unhealthy roots.

Just here, it might be wise to mention some interesting facts to show the reasons for preservation of the deciduous teeth. Up to the time of the advent of medical and dental inspection of children, little was known of their physical defects, and great was the surprise when it was found that a large percentage had numerous defects, such as defective vision, defective hearing, enlarged tonsils, adenoids and defective teeth. Of these defects, the last three are the most common.

Examination of school children the world over shows that as a rule between ninety and one hundred per cent. have defective teeth. To bring these statistics closer home, a test examination of two schools in Toronto gave the following interesting facts:

	Per cent
Number of children needing treatment	95.75
Number of cavities per child	7.19
Number of defective teeth per child	5.78
Number of children having abscesses	4.1
Irregular teeth	4.3
Power of mastication impaired	6.3 1/2

The above results lead us to wonder what is the cause of such conditions, and here we are confronted with the fact that the average parents are entirely ignorant of the value of the temporary teeth. Some believe that they must decay before the permanent successors

can erupt, while many others cannot see the advantage of having them attended to when they will be lost so shortly.

The preservation of the temporary teeth is of great vital importance to the child for the following reasons:

I. It is not wise to let the child suffer with toothache, for it causes nervousness, chorea or St. Vitus Dance, and sometimes vicious and criminal tendencies, along with dullness at school, can be directly traced to the condition of the teeth, and upon treatment and repair of teeth, these conditions are overcome.

II. There is no other period in life when an individual needs every ounce of nutrition obtainable so much as in childhood. For the child has to double and treble his weight, his body, mind and moral fibre are developing, and if his masticatory apparatus is impaired by numerous cavities in the teeth, he cannot be expected to get all the nutritional value out of his food.

III. The mouth being the entrance to the body, through which all food, drink and some air passes, therefore an unclean mouth must contaminate all food and drink. For the various cavities contain bacteria and their products, along with decaying food from previous meals, as well as the pus from the so-called "gum-boil." This is mixed with the food and carried on into the stomach, which is over-taxed, and we have as a result, indigestion, anaemia and constipation.

The epidemics of children's diseases, such as measles, chickenpox and scarlet fever, bear a direct relationship to the conditions of the children's teeth, for the decayed teeth form an admirable lodging and breeding place for germs. It has been found in numerous cities that epidemics of these diseases can only be stamped out by having every child affected, compelled to have the teeth and mouth put in a healthy condition before return to school.

IV. The early loss of the deciduous teeth causes many irregularities in the permanent teeth, as does also the too late retention of these deciduous teeth. If the pulp of these teeth remain intact, Nature's plan of exfoliation is very thorough, but with the loss of the pulp, the resorption of the root ceases and the tooth is consequently retained too long, thus producing irregularities in the erupting permanent teeth.

THE TREATMENT OF DECIDUOUS TEETH.

CAVITIES IN VITAL TEETH.

The treatment of cavities depends to a great extent upon the age and the general health of the patient, as well as on the care of the mouth. Generally speaking, the six anterior teeth do not need to be filled. If decayed, the decalcified tissue is removed thoroughly with an excavator or large round bur. After complete removal of the decalcified tissue, the teeth should be dried with alcohol and the cavities painted with a solution of silver nitrate, about 4 per cent.

In very rare cases, I fill these cavities with white copper cement, following the above treatment. Just here I would like to explain that in doing any operation, I always explain as well as possible to my little patient what every instrument is for, and how I use it, and what it does. I allow them to handle the instruments whenever possible. Now, in removing decay from a cavity, I invariably start with an excavator, and then I explain that I am going to do just the same thing with a round bur in the engine, only that it does it more quickly and more thoroughly. In this way I never hesitate to use the engine, and it is very seldom I ever find a patient that I cannot use any of the ordinary instruments and appliances used for adults.

The deciduous molars, where the cavity is shallow and tooth to be exfoliated shortly, it is only necessary to remove the decay and paint the cavity with silver nitrate solution. In deeper cavities, and where the tooth is to be retained for a couple of years following the above treatment, the cavity may be filled with black copper cement.

TREATMENT OF EXPOSED PULPS IN VITAL TEETH

In a great majority of cases, unless the pulp is too extensively exposed, I invariably resort to pulp-capping. First carefully excavate the decalcified tissue and dry cavity, cauterize with phenol. Then cover the exposure with a paste of oxidized zinc and oil of cloves. Next take a small piece of paper just large enough to cover the floor of the cavity, mix a thin mixture of oxy-phosphate of zinc cement and place it on one side of the paper and place the cement side down in contact with the cavity seat, gently tapping it to place so as to avoid pressure. Now the cavity may be carefully filled with copper cement. Now if the pulp should die in one of these cases, and we have the patient under our care continually, we have a fairly easy condition to cope with; an easier one, to my idea, than what the extirpation and removal of a vital pulp from a deciduous tooth is.

In a very few cases, however, it is absolutely necessary to extirpate the pulp, and there are two methods open in most cases. The first one is reasonably safe, but a rather slow and difficult operation. The second one is fairly easy and quick, but rather dangerous, unless one remembers well the prospective dates of complete calcification and of commencement of decalcification of the roots of temporary teeth.

We will first consider the safe and most reliable method, the use of Phenol. This is a somewhat slow and tedious operation, and generally requires from three to five sittings. At the first sitting, seal in Phenol in contact with the pulp after having enlarged the exposure. At the next sitting, after from three days to a week, it is often found that the pulp can be removed entirely from the chamber. Then force Phenol into the root canals, using pressure with raw vulcanite, and leave for three or four days. At the third sitting, usually by carefully manipulating the broach, the pulp may be all removed, although it may take a couple of additional sittings in some cases.

The second method of procedure is the use of a very limited quantity of arsenic, and as these teeth are very susceptible to its action, it should never be left more than twelve hours. In connection with the use of arsenic, it is necessary to remember that in temporary molars, generally speaking, the roots are completely calcified at the third year and decalcification does not commence till the seventh or eighth year. After twelve hours the pulp can usually be removed with barbed broaches. The canals are dried out and flooded with a solution of silver nitrate. The roots are then filled with a paste of calcium phosphate and creosote. The cavity in the tooth can then be filled with copper cement if it is not too large.

If the cavity includes two-thirds or more of the crown, the crown should be ground down, leaving a saucer-shaped cavity which is stained with silver nitrate.

PUTRESCENT PULPS.

Teeth with putrescent pulps should have the canals thoroughly cleansed and a mild treatment of fomo-cresol sealed for a few days. If the conditions are favorable at the next sitting, the canals should be dried and stained with silver nitrate and the cavity filled, if not too large, or the crown ground off and the remains painted with silver nitrate.

ABSCESS WITH SINUS.

All decay and pulp debris should be removed and the sinus cautiously washed out with sterile water, followed by a little oil of cloves or creosote, using pressure with raw vulcanite to force it through. The tooth should be sealed up and left for three or four days, when in most cases the sinus will have healed, for these cases respond very readily to treatment. Mechanical and medicinal treatment should follow, and when in a healthy condition it should be similarly treated to the other pulpless teeth.

In extracting for children, it is only wise to extract teeth which are loose due to the absorption of roots, or those in which the pulp having died and the permanent successor can be detected as forcing its way up to place. Also any case in which severe abscess contraindicate further retention. If only loose teeth are to be removed, there is very little need for an anaesthetic, although a local anaesthetic can be quite nicely used. In cases of extensive extraction or of bad abscessed conditions, somnoform perhaps gives the best results.

PERMANENT TEETH.

The treatment of permanent teeth for children, except in very rare and much neglected cases, resolves itself into the treatment of the six-year molars. This tooth, the most important in the whole mouth at this time, is perhaps the worst neglected and most frequently lost permanent tooth. This is due to ignorance on the part of parents, and sometimes due to a mistake on the part of the dentist. It is

allowed to decay quite frequently under the impression that it is a temporary tooth.

The position in which it erupts, behind the second temporary molar, and the age at which it appears, are the two surest guides as to its identity. The great importance of this tooth is due to two functions it performs:

1. It provides a masticating surface during the process of shedding of the deciduous teeth.

2. It maintains the horizontal and perpendicular relation of the jaws at this time.

If children are brought to the dentist regularly, commencing at from two to three years, and the dentist sees them thereafter after every six months, very little is necessary to be done to any of the teeth, and especially to the permanent ones; but unfortunately usually the first time a child is brought to the dentist it is because of toothache, and quite frequently because of a toothache starting in the first permanent molar. Now our first concern is as to the involvement of the pulp, for none of the permanent teeth have their roots completely calcified till about three years after eruption (excepting the cuspid), and death of the pulp before completion of the roots means that they are never completed, and consequently the tooth is lost in a short while.

In almost all cases where the pulp is but slightly involved, it is best to resort to pulp-capping, and in this way retain the pulp as long as possible with the hope that it will remain alive till the roots are completely calcified. A temporary filling may be put in the tooth and the patient advised that upon the least return of severe pain from that tooth, to return and have it attended to.

If, however, the pulp is exposed to too great an extent, it must be devitalized and removed. It is wise in this case not to leave the arsenic more than 24 hours at the most, and to remember in removing the pulp and filling the canals, that the roots are not fully developed. As a root canal filling in these cases, I have used aristol, oxidized zinc and creosote, along with gutta-percha cones very carefully inserted. These teeth are almost invariably lost in the course of a short period of time.

Occlusal cavities not involving the pulp should be made to include all fissures if at all possible, but with some delicate children it is only wise to remove the decayed area.

Proximal cavities should almost invariably be carried onto the occlusal surface, but this depends on the patient.

Often before the fissures in a molar become decayed, they may be treated with a mild solution of silver nitrate, dried and a little copper cement squeezed into them, thus preventing decay in a defective fissure.

In closing this rather lengthy article, I wish to state that the above methods of treatment and statistics are not intended to be original, but have been learnt from the personal instruction and

articles of the late Dr. Doherty and of Dr. J. A. Bothwell. I have been putting them into practice almost constantly since I graduated, and lately most extensively at the Hospital for Sick Children, and I have found them to be remarkably successful. In my work at the Hospital for Sick Children, I have had to work for children from seventeen months of age up, and I don't know of any work that is more interesting and enjoyable than working for the kiddies.

Dental Work in Toronto Hospitals.

IN the Monthly Report of the Department of Public Health for the City of Toronto, an interesting account is given of the work being accomplished in the hospitals of the city.

The work in the adult clinics is growing very rapidly. At the General Hospital the work is really being transferred, as so many patients are asking for treatment. At the present time the appointments have to be made four weeks ahead. This is a great handicap, as there is always a great deal of emergency work.

In the Western Hospital almost the same condition exists, and is growing worse all the time.

In order to overcome this crowding it will be necessary in a very short time, possibly the first of the year, to have the adult clinics for all day. At present the clinics run only in the forenoon.

Several interesting cases of arthritis have attended the clinics for treatment. One lady, a city order patient, had been in the hospital nearly three months, practically a cripple in bed. After attending the Dental Clinic and having her mouth and teeth made healthy she showed signs of marked improvement almost immediately, and in four weeks' time was able to go home, almost completely cured. If it had not been for the Dental Clinic she would have been, in all probability, in the hospital yet. Several similar cases have been presented in the last month, and the results obtained are very interesting. These cases tell the real value of the Dental Clinic in hospital work. Such a clinic is a great asset to the hospital and to the city.

A large number of patients are in poor health, purely because they have unhealthy mouths, and after their mouths are made well they usually recover their health rapidly. Many physicians, and others too, realize that a great many of our ills come from unhealthy mouths. As a result of the prompt recovery of many patients after dental treatment both the patient and the city are saved much expense.

Important Announcement.

PARTIAL DENTURES AND REMOVEABLE BRIDGEWORK.

NO more striking object lesson is needed by the observing dental practitioner, of the frequent failure of "ordinary" partial dentures, than the diseased conditions (caries, pyorrhea, abrasion, etc.) that frequently result, sometimes, indeed, presenting from even the better class of dental office. Excepting possibly the question of the root-canal-septic-foci question, there is no bigger problem in dentistry to-day than that of the design of a simple, comparatively inexpensive, removeable, non-irritating, sanitary, mechanical efficient, and unobtrusive restoration of the partial denture removeable bridge type.



The construction of this type of restoration may, and should be, well within the reach of the average and even near-average practitioner and his faithful and efficient co-worker—the laboratory man—and, most important of all, within the reach of the great mass of the semi-edentulous public.

This important subject will be thoroughly covered in a series of three articles to appear in the March, April and May issues of ORAL HEALTH, and fully illustrated with drawings, photographs, etc., under the heading of "Partial Dentures," by Dr. W. E. Cummer, Professor Prosthetic Dentistry, the Royal College of Dental Surgeons, Toronto. This material was originally prepared for the meeting of the Virginia State Dental Society, in Richmond, Va., during November, 1915. It has since been presented, with alterations and additions, before the Montreal Dental Club, on December 1, 1915; the Toronto Dental Society, December 16, 1915; the Hamilton Dental Society, January 12, 1916, and to be given before the First District Dental Society, New York City, February 7, 1916; the Alumni Association of the Dental Department, Buffalo University (in clinic form), Buffalo, February 19, 1916, and the meeting of the Michigan State Dental Society, to be held in Detroit during April, 1916.

The outstanding feature in this series of articles is the all-removeable design, reducing the cutting of teeth to a minimum, skeleton metal construction (in no case touching the gingival margin or reaching below the free margin of the gum), with simplicity and as little possible expense of time and materials. Principles, believed to be

largely new, are introduced, notably those described under the caption of indirect retention, the latter chapter which no dentist can afford to miss. The series is written with the sole object in mind of service to the public through the dental profession, and is made as practical and free from complexity as lies within the power of the writer.

Concluding the series is a synopsis setting forth in detail the steps in simple and difficult specific case involving upper and lower, constructed in the most careful and scientific manner, using Professor Gysi's principles of anatomical articulation and involving principles of direct and indirect retention. Illustrations will be obtained from photographs of models prepared by Mr. C. L. Daly, of Toronto, whose assistance has been invaluable to the author in the preparation of that branch of the paper.

Russian Women Dentists.

IN view of our growing interest in Russian affairs, a note on dental conditions in that great Empire may be opportune. In Russia, dentistry is regarded as one of the best professions for women, who are estimated to constitute 90 per cent. of dental practitioners. The chief school is the Dental College at Petrograd, which has 600 students, less than 5 per cent. of whom are men. There are also large dental colleges at Moscow, Odessa, Kiev and Warsaw. Before entering upon the three years' dental course the student is required to have matriculated. The fees amount to £20 per year, and the State diploma costs £2, a license to practise being only granted on proof of qualification.

The first year's studies are devoted to mechanical dentistry; in subsequent years the student does clinical work from 10 to 5, and lectures follow until 9 p.m. Examinations are held every month. The lectures at Petrograd number about twelve, and come from the Imperial University Faculty of Medicine, while the ten demonstrators are chiefly women. For both medicine and dentistry fees in Russia are considerably lower than in this country, and hours of work are also longer. Men seem to prefer to enter the medical profession, and it is said that even in the capital city of Petrograd the men dentists of standing do not number more than half a dozen.—*British Dental Journal*.

The Canadian Army Dental Fund.

THE following subscriptions have been received by the Treasurer, Dr. C. V. Snelgrove, 105 Carlton St., Toronto, since the last report in ORAL HEALTH, and appended is a complete statement of Receipts and Disbursements to December 31, 1915:

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J. Boyne, Montreal	5.00	Dr. J. D. MacMillan, New-	
Stanley Burns, Montreal	5.00	castle	5.00
J. K. Cleary, Montreal	5.00	Dr. A. H. Merrill, St. John ..	10.00
E. A. Cleveland, Montreal ...	5.00	Dr. J. D. Maher, St. John ...	10.00
E. W. Charron, Montreal	5.00	Dr. F. C. Bonnell, St. John ..	5.00
C. DePencier, Montreal	5.00	Dr. G. O. Hannah, St. John ..	5.00
Leo Doran, Montreal	5.00	Dr. C. F. Gosham, St. John ..	5.00
H. V. Druir, Montreal	5.00	Dr. Otto Nase, St. John	5.00
M. Gold, Montreal	5.00	Dr. W. P. Bonnell, St. John ..	5.00
H. S. Gross, Montreal	5.00		
W. G. Kennedy, Montreal ...	5.00		
G. H. Kent, Montreal	5.00	Total Subscriptions	\$3,423.28

TREASURER'S STATEMENT

TO 31ST DECEMBER, 1915.

RECEIPTS.

Received by Dr. Snelgrove	\$3,120.01
Received by Lt.-Col. Armstrong	303.27
Bank Interest	11.01
	<hr/> \$3,434.29

DISBURSEMENTS.

To T. Eaton Co. for Operating and Laboratory coats, cottonwipes, and special supplies	\$ 831.12
To C. A. D. C. Overseas—	
Per Lt.-Col. Armstrong	303.27
Per Major A. A. Smith	1,500.00
Printing	80.50
Secretary's Office	6.09
Treasurer's Office	1.80
	<hr/> 2,722.78
Balance on hand as per Bank Account	<hr/> \$711.51

A Fifty Dollar Letter.

AT the last meeting of the Toronto Dental Society, Dr. C. E. Pearson read a letter he had recently received from Captain Mallory, C.A.D.C., who is stationed at Salonika, Greece. Upon the conclusion of the reading there was a spontaneous call to "pass the hat," with the result that \$50.00 is placed at the disposal of Captain Mallory, to be spent at his discretion, in helping necessitous cases that come under his notice, and thus in a small way relieving some of the distress in the war zone.

Captain Mallory's letter follows:

"Salonica, Greece

"No. 4 Canadian General Hospital

"(University of Toronto)

"Dec. 5th, 1915.

"My Dear Charlie,—

"I am sure if you were out here you would fully be repaid for any trouble you could take in giving these fellows any comfort whatever. Their thanks and appreciation are fine, and it is really wonderful how good, decent fellows they are, and what they have to put up with, sleeping out all night and no supper are common things. The money that you so kindly sent me is more than getting value out here. I gave cigarettes to some, some cheap note-paper to write home with to others, some Oxo soup (hot), and to one fellow I gave a pair of rubbers, and another fellow some bread. I tell you I take off my hat to the British Tommy as we see them here. The Tenth Division came here from the Dardanelles and went up to the front with summer clothes, and last week we had three days and nights of 15° of frost. It was 15 above zero in my tent, and we have 600 frost-bites in the hospital, and yet these fellows do not complain, but want to get well quickly and back to their lines. The British officer is another fellow, but the Tommy is a real man, and anything I have he can have.

"The hospital is situated on a slight slope four miles from Salonika and is in a really good situation. There is not a tree in sight, but in whatever direction you look you see a mountain of course. The highest is Mount Olympus—the Greek God. It is about sixty miles away and being 10,000 feet high, but some days with the sun shining brightly on it you think it is only a nice walk. The snow on its top is nearly always visible. We are on the main railroad going to Serbia, and also on the wagon road. We are a clearing hospital. We clear to hospital ships. We had 1,300 on day before yesterday, and to-day a ship came in and we got rid of 250. In one depot we are going all day long; we see from forty to sixty patients a day, and do mostly amalgam and extraction. To-day we extracted with local anaesthetic sixty-eight teeth, eight amalgam fillings, six repaired dentures, three pyorrhea cases, and I can assure you that is a full day's work. We have a large workroom to work in, and the light we use is the light that comes through the canvas, and when the sun comes out it is fine, but I do not think we will be able to stand it next summer without a fly, and that would block the light. One day the wind came and blew George's cabinet over his patient and himself and broke a lot of stuff, but such is life in a big country. I received the magazine you sent, but we have only had two mails since we left England seven weeks ago.

"We are going back by Berlin and see if we like the d—— place."

The Late Charles Edward Sale, D.D.S., Toronto

IT is our sorrowful duty to record the demise of Major C. E. Sale, of Goderich, a member of the Board of Directors, Royal College of Dental Surgeons of Ontario, who has died a war hero in France. Major Sale's name is the first to be transferred from the ORAL HEALTH Active Service Roll to the Roll of Honor.

A Fellow-Practitioner's Tribute to the Late Major Sale

L. M. MABEE, D.D.S., GODERICH.

MAJOR CHARLES EDWARD SALE, of Goderich, died in Flanders on Monday, January 17th, 1916, in an ambulance while being taken to No. 5 Base Hospital, after being wounded in the leg.

Major Sale had just been back to the trenches about three weeks, his absence having been caused by previous injuries. He was attached to the 18th Battalion, under Col. Wigle, and trained six months in London before going overseas last spring.

The late Dr. Sale was born in London township in 1878. He attended the London Collegiate Institute, and afterwards went to Sarnia in the office of Dr. Homer Kinsman as a dental student. From here he entered the Royal College of Dental Surgeons of Ontario at Toronto, graduating with honors, and finally locating in Goderich. For the past twelve years, while practising his profession in Goderich, he was much esteemed by his fellows in the profession as well as by the public generally.

He was a member and Past President of the Menesetung Canoe Club, a social organization of the town. He was a Past Master of Maitland Lodge, A.F. & A.M., a member of Huron Chapter, a member of St. Elmo Preceptory at Stratford, and a member of the Ancient and Arabic Order of the Knights of the Mystic Shrine at London. Major Sale was also a member of St. George's Church.

When the war broke out the late Major Sale was one of the first to enlist for King and Country to go overseas, having been a member of the 33rd Huron Regiment and Captain of the Brussels Company. The news of his death, by cable from the front, cast a gloom over the whole community. He leaves to mourn his loss, besides a host of friends, a widow (formerly Miss Kate Hughes Campaigne, of Goderich), a son of seven and a daughter of four years, also Ira, a brother, a South African war veteran, now in training for overseas service at Brandon, Man., and two sisters, Mrs. Albert Johnston, of Sarnia, and Mrs. Gilbert Porte, of London.

The late Major Sale was elected a member of the Board of Directors of the Royal College of Dental Surgeons at the last



CHARLES EDWARD SALE

biennial election, and was honored, respected and loved by his dental friends throughout the whole Province of Ontario. In his loyal sacrifice he has brought lasting honor to his chosen profession.

Dr. J. P. Marshall, Deceased, Toronto.

DR. J. P. MARSHALL passed away, in his 66th year, after a protracted illness extending over twelve months. The late Dr. Marshall practised dentistry for over twenty years in the town of Shelbourne, moving to Toronto about twelve years ago, where he continued his practice. The deep sympathy of the dental profession is extended to Mrs. Marshall in her bereavement.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

DENTAL PHYSIOLOGY.

ONCE out of school, the dentist is not very much interested with literature concerning the physiology of the tooth. It is with renewed interest, therefore, that we read the views of Dr. Ragnar Eckermann, of Sweden, as contained in an article published in the *Dental Record* (November). Many of his statements will appear to be somewhat revolutionary in character, yet are of more than passing interest to dentists. Among the author's conclusions these may be mentioned: "The earlier a tooth erupts the greater is the volumetric proportion between weak and hard tissue, between pulp and dentine. The pulp chamber has then its maximum size; the walls of dentine their minimum size and the protecting membrane still has porosities. A tooth erupted at normal time has certainly also porosities on the enamel, but they are narrower, less numerous, and lie farther from the pulp, and would, of course, be subject to shorter exposure to possibly existing harmful agents than in the case of a too early erupted tooth. Late erupted teeth are embryologically more developed, and, consequently, have still fewer porosities, if any, in the protecting membrane, and are thus to be regarded nearly as immune from caries."

On the assumption that a tooth is built up from the centre, Dr. Eckermann concludes that a too early erupted tooth has a more porous enamel than a normally erupted one, and that the tooth becomes more readily a prey to caries than would be the case of a normally erupted one. The more mechanical injury the enamel and dentine suffer (breaking hard biscuits, etc.), the stronger the tooth will become, because it hastens the retrogressive metamorphosis of the pulp, and the dentine changes into a tissue which can endure attacks. The factors favoring this process of the pulp are described as

- (a) Artificial (metal fillings, grinding of the cusps).
- (b) Natural (wear and tear of the teeth, hard mastication).

Following this line of argument, Dr. Eckermann concludes that owing to the relation between fillings and pulp-contraction it is best that young teeth be filled with metal, and that the grinding of the cusps of mature teeth may be indulged in as a prophylactic means against caries.

"Everything which stimulates the retrogressive process is at the same time a prophylactic against caries." In an effort to substantiate this claim, the author points out "That for purposes of good occlusion, when fitting crowns, we can grind off the top of the antagonist without a trace of caries being seen later on. We also daily see people who have worn out their teeth until half of the crown or more has gone, the top of the tooth often forming a deep retention place, but nevertheless no caries has appeared."

Although not agreeing with the use of such radical means to bring about the deposition of secondary dentine, we, as dental practitioners, know full well that such a process does go on to a greater or less extent if conditions be favorable.

In *Dental Cosmos* (November), Dr. James R. Cameron, resident dental and oral surgeon in the Episcopal Hospital, Philadelphia, reports an interesting case of the formation of secondary dentine which came under his observation. He says: "The patient, a little girl of thirteen years, presented with a carious upper left first molar. During process of excavation the pulp was accidentally exposed. A dressing of Black's "1, 2, 3" preparation, with one-eighth grain of cocaine, was applied as a sedative, and the patient told to return in two days. She did not return before the ninth day. On opening the tooth, which had not given trouble in the interval, it was found that a deposit of dentine had formed over the exposed pulp. The new dentine was quite firm and of a lighter color than the surrounding structure."

The views of Dr. Eckermann are brought to the attention of readers of ORAL HEALTH, not because of concurrence with same, but rather owing to their novel character. It is rather disappointing that he offers no explanation for the necessity of devitalization of teeth that have become sensitive through just such a process (grinding) as the author claims will create a protecting layer of dentine over the retrogressive pulp. Again, why is it that devitalization is so often brought about by such processes (mechanical violence, etc.) as, according to the author's theory, ought to cause immunity to the pulp?

REASONS FOR MISFITTING DENTURES.

In the November issue of the *Dental Record*, Dr. D. M. Shaw (London) summarizes some of the chief causes of failure to reproduce the form of the impression surface on the finished denture:

I. Deformation of plaster cast surface by warping or damage:

(a) Warping by bad mixing, poor and weak plaster, or excess of water; or by hurried drying and overheating.

- (b) Forming or trimming a thin and weak cast, or disturbing the cast during setting.
 - (c) By expansion, when or after mounting on articulator, *if a groove is cut* in the base of the cast to let in the arm or bar of the articulator.
 - (d) Bruising or rubbing of surface of cast, by careless and heavy handling.
 - (e) Deformation or fracture when flasking, by leaving the last mould plaster to crystallize under the continuous pressure of the flask press.
 - (f) Deformation of cast when packing rubber, by excess of rubber and undue pressure in closing flask.
- II. Deformation or warping of rubber after vulcanization:
- (a) Letting steam pressure down too quickly. (Time and temperature of vulcanizing is assumed to be correct).
 - (b) A water-logged plastercast, or a cast from any cause too weak to resist contraction of the vulcanite.
 - (c) Immersing the hot flask in cold water. Rapid cooling means unequal cooling—and therefore unequal contraction of the vulcanite.
 - (d) Opening the flask while the vulcanite in it is still too hot or warm.
 - (e) Warping of vulcanite when softened by heat developed by friction in polishing.

THE X-RAY IN DENTISTRY.

Of late much has been written and spoken in support of the use of the X-Ray for dental purposes. There is at all times a tendency to label as "old-fashioned" those who advocate a policy of conservatism when dealing with new and probably somewhat dangerous methods of practice. Fortunately for the dental, as well as other professions, a certain number of its members risk the imputations of senility and venture to erect a few danger signs, so plain that "he who runs may read."

In an article appearing in November issue of *Oral Hygiene* by Dr. J. Wright Beach, entitled "An X-Ray of the X-Ray," the author—one who has had extensive experience in X-ray work—suggests that it may be made a "good booster for Ananias, and has one of the most accommodating characteristics of Holy Writ in that it may be interpreted to suit the tastes and inclinations of the interpreter." The question as to what extent reliance may be placed in the radiograph as a means of diagnosis by the dentist is, in Dr. Beach's opinion, one of paramount importance. "It requires an unusual intimacy with its idiosyncrasies and great experience in its interpretations before a reliable opinion may be rendered." Unless the X-Ray apparatus is one of the improved and up-to-date outfits, the radiographs obtained may be very obscure and wholly

unreliable in diagnosis. "Experience, common sense and good judgment" ought to be of supreme aid to the dentist, and the X-Ray used only as a source of appeal. Dr. Frederick W. Fralim takes up this same point in the *Dental Record* (November). After stating that he has used the Roentgen rays since 1904 for their diagnostic value, he says: "I do not feel prepared to positively state upon examining a radiograph that a given condition prevails, or that certain pathological lesions are present. There is too much of an element of doubt surrounding such a diagnosis, and I would not be willing even to extract only one tooth on the simple findings of a radiograph."

Great emphasis has been placed in recent articles dealing with the much-mooted question of root canal fillings, upon the fact that radiographs show that a large percentage, as high as 97 per cent., of teeth whose roots are filled, have apical areas. If this condition really obtains, then the dental profession must admit complete failure in one of its most important departments of operative procedure. Perhaps the case against the dentist is not as clearly proven as one would be led to believe. What is the basis of the sweeping indictment? Clearly the X-Ray findings are responsible. Do these form sufficient material for diagnosis of infected areas? Not all persons whose opinions carry weight in the profession hold to this view. As a proof of the error of placing too much reliance in the radiograph, it may be pointed out that from one film several prints may be made, each varying in detail. The difficulties of developing, skill in preparing the fixing and clearing solutions, the evenness with which the tube works, the uniformity of gelatine—these are all factors leading up to the production of good X-Ray prints.

The use of the X-Ray, as we have it to-day, ought, in the opinion of many, to be restricted. Its indiscriminate and unscientific use may lead to grave harm to both the subject and operator. It may cause serious growths to form on the operator's hands, or it may be the means of permanent injury from burns, to the X-Ray subject. It is even said to impair the progenitive powers of the male.

It might possibly be inferred from the foregoing that the X-Ray has little, if any, place in the field of dentistry. This view is assuredly not a correct one. As Dr. Beach points out: "The science of radiography is one of the greatest boons to dentistry that the twentieth century has yet produced, and it would be presumptuous to say that it has thus far approached its fullest development." It might be deemed advisable, in view of the dangers of its unscientific use, to refer our patients to institutions equipped with the best apparatus obtainable and have them come under the care of experts trained in handling all the devices designed to secure the safety of the X-Ray subject. If such centres were established then a fee could be arranged, sufficiently low to bring the benefit of the X-Ray within the reach of all, and at the same time reduce to a minimum any risk of injury to the subject. Quoting Dr. Beach again: "It (the

X-Ray) is an expensive plaything and a cheap necessity. When we need it, we need it badly, but when circumstances are the reverse we have no right to burden our patients with the uncalled-for expense."

DISEASED TISSUES OF THE ORAL CAVITY.

The discussion of this subject is usually left to the members of the medical profession. It is then with more than usual interest that we read Dr. W. C. Smith's (St. Louis) paper, which was presented to the Illinois State Dental Society in May, 1915, and reported in the November issue of the *Dental Review*. The author is quite frank in stating that he was led to a more careful consideration of the diseased condition of the oral cavity because of a sense of embarrassment occasioned through inability "to diagnose or suggest the etiology and treatment of a number of these diseases when consulted by physicians." Thinking that probably other dentists may have been in some such a predicament Dr. Smith essays to render assistance. He finds that dentistry is apt to become too specialized a branch of medical science. We ought not to confine ourselves exclusively to treatment of tooth lesions. Would it not be advisable then for our colleges to extend somewhat their curriculum of studies so as to include the diagnosis and treatment of the most common diseases of mouth tissues? It may be said by some in opposition to such a departure that this work is not properly the dentist's, and that in attempting treatment of such diseases we are usurping the function of the physician. With this view many may, in part at least, agree, yet no one will venture to dispute the vantage ground of the dentist in being, in a great many cases, the party to whom is afforded the first opportunity of seeing indications in the mouth. Is it not true that most persons seek the advice of a physician only after the affection has well advanced? If the dentist does not deem it within his province to treat disease of the mouth tissues, he ought surely to be able to accurately diagnose such conditions and refer the patient to the physician for early attention. In this way, perhaps better than any other, can we hope to bring about the desired co-operation between the dentist and the physician.

THE TONGUE.

Dr. Smith finds in the appearance and superficial condition of the tongue an index to most gastric and to many other general disturbances. Tremulous action, extreme dryness, blueness, a very red shining glazed aspect—all these are indications upon the tongue of dangerous conditions.

LUDWIG'S ANGINA.

Septic infections of the floor of the mouth and the neck are usually secondary to some infection in the mouth, nose or pharynx. Broken down teeth may be the means by which the infection enters. In the infection of the cellular tissue planes there is the condition of cellu-

litis. If this infection becomes rapid and extensive, a condition obtains known as "Ludwig's Angina." This is an acute spreading infiltration of the soft tissues, starting in the floor of the mouth and sub-maxillary region, which binds all the structures into a hard, board-like mass. This mass becomes attached to the jaw bone and presses the tongue upward and backward into the pharynx. Pneumonia is often a complication. As a means of treatment free incisions are resorted to, wounds are packed with gauze and are never sutured.

The author would have dentists become proficient in the early diagnosis of this condition because of its high rate of mortality. Delay adds greatly to the difficulties of treatment.

SYPHILIS.

This is a disease whose baneful results place it at the head of the list of all diseases of the human body. It is one of the diseases that is on the increase—a fact that causes us all to pause and consider means for its eradication. Whatever excuse may be offered for ignorance in detecting other diseases peculiar to the soft tissues of the oral cavity, surely none can be offered for the dentist's lack of skill in the diagnosis of syphilis! To proclaim a dental operator, who is careless or indifferent in this particular, a criminal is not too severe an indictment. Some of the greatest manifestations of syphilis are in the oral cavity, and many of them are highly infectious. Here, then, is a source of danger not only to patients, but also to the dentist himself. 'Tis true that there are certain stages in which syphilitic discharge may be non-infective, yet there is need of extreme caution at all times. Skill in diagnosis is of paramount importance. Students in our dental colleges ought to receive full instructions in this regard.

Dr. Smith says: "The minutest amount of discharge from a syphilitic sore in certain stages of the disease will inevitably produce the chancre, which is the initial lesion." Where a dentist is positive that the mouth ulcers are syphilitic, then the most complete form of sterilization of instruments should be resorted to. It is deemed advisable to destroy such things as napkins, rubber dam, etc., rather than trust to the efficiency of any method of sterilization.

"The oral lesions that are dangerous, aside from the primary chancre, which may appear upon the lips or in the mouth, belong to the secondary, the eruptive stage, and consist of the degeneration of mucous membrane, and are analagous to those taking place in the skin. Syphilis may, or may not, pass through the two stages, primary and secondary. It is only when acquired by inoculation that syphilis presents all its characteristic phenomena. When it is congenital it is without the initial lesion—the chancre." The chancre is located at point of infection, but does not make its appearance until a time of ten to sixty days have passed. The chancre, which is a positive indication of syphilitic poisoning, presents three distinguishing features: First, an incubation period which is about twenty-one days. Second,

certain special characteristic appearances. Some kind of a papilla or pimple situated at the point of infection and varying in size. It is dark in color, elevated a little above the general surface, and is embedded in an indurated sub-cutaneous, infiltrated mass which, between the thumb and finger, feels like cartilage. After about ten days the epithelia upon the surface of the chancre softens and it becomes covered with a grey film. The central point ulcerates and discharges a serum which is highly infectious. Third, soon after the appearance of the chancre, the nearest lymphatic gland becomes enlarged and undurated, thus indicating the beginning of the constitutional affection. In the mouth and in the mucous membrane the eruption is usually first seen in the macular form—that is, reddish or copper-colored spots. Dr. Cameron (Cosmos) says that many cases of syphilis have been reported to the Episcopal Hospital, Philadelphia, all evidence pointing to the dentist as the disseminator. He also refers to nine cases of syphilis reported by Baldwin of Chicago, all being contracted during dental operations. Two dentists were infected as a result of operating upon diseased patients.

Dr. Smith concludes his valuable paper by urging all dentists to form the habit of examining carefully all lesions of the soft tissue of the mouth before beginning to operate on the tooth tissue.

GERMICIDAL PROPERTIES OF DENTAL CEMENTS.

The great need of research work to ascertain which are the best materials to use when making restorations in the mouth is at last being recognized. In quite a number of the universities of the United States experiments are being conducted with a view to rendering dental operations more permanent in character.

As illustrating the benefits of such research work let us consider the finding of Dr. M. R. Smirnow, as a result of experiments carried on in the laboratories of Bacteriology and Pathology at Yale University. The question of the germicidal properties of dental cements received his attention. The following cements were used in the experiments: (1) "A pioneer and admittedly reliable black copper oxid cement, which boasts of a very high percentage of black copper oxide and extraordinary germicidal qualities; (2) A red copper oxid cement, which claims to be the first of this particular form of cement, advertising a content of 25 per cent. red copper oxide; (3) One white copper cement; (4) A light greenish-yellow copper cement; (5) An ordinary zinc oxide or oxyphosphate cement."

Various methods were devised in order to make conditions of the experiments similar to those to which the cements are subjected when used in the mouth. For instance, one line of tests dealt with the action of cement pellets when placed in cavities of extracted teeth. The results were carefully tabulated, and the findings ought to prove of great interest to all practitioners. One of the conclusions arrived at was that very efficient antiseptic qualities of the cement are due

partly to the action of the phosphoric acid contents of the liquid. It was also found that a cement, used as a filling material, may act germicidally in several ways: First, "By mechanical means, in filling up the cavity and depriving many of the organisms present from the free oxygen they require for their sustenance. Second, the cement pellet forms a very effective barrier to all forms of nutrition, so that many of the bacteria may succumb on account of lack of nutriment. Third, the pellet may also act as a barrier to the proper disposition of the waste products of bacterial growth which, if accumulated, will act as an inhibitory agent to the farther proliferation of the bacteria. Fourth, the actual antiseptic or germicidal action of the cement itself."

Taking up the last item, namely, the actual antiseptic or germicidal action of the cement itself: It was found that there are grades of germicidal efficiency in the cements tested. The two most efficient cements were the black and red copper cements, and of these two the red copper cement easily surpassed the black copper cement in germicidal properties. These cements of a lighter color, even those having copper contents, were far inferior to the red and black copper cements. "Under these tests, red copper oxid cement excelled all others, showing evidence of but three failures in twenty-five teeth tested."

SECONDARY HEMORRHAGE

Occasionally a case of hemorrhage is presented which causes considerable trouble in treatment. Fortunately, few cases prove as persistent as the one reported by Dr. James R. Cameron, *Cumec* (November issue), which is here cited because of the method of treatment adopted. A man fifty-five years of age had a secondary hemorrhage five days after the teeth had been extracted, under a local anesthetic. The sockets were first packed with tannic acid and glycerine on cotton. No relief resulted. Then each socket was packed with plaster of Paris, but the bleeding continued. A second packing of plaster of Paris followed and a wad was placed in the mouth, the jaws tightly closed and a Barton bandage applied. Hemorrhage persisted. Patient was then given two successive administrations of horse serum (15 C.C.). A slight improvement was noted. This was only temporary, however, for blood commenced oozing again. The plaster of Paris was removed from the sockets and 30 per cent. Argyrol was inserted on a cotton wad. This arrested the bleeding.

FUTURE OF DENTISTRY

Of dentistry one may say, the past is glorious; its future crowned with opportunities. A retrospect of dental achievements, with its record of successful struggles for "a place in the sun," is calculated to give us a certain pardonable conceit. A glance at the future, however, sobers our thoughts with an almost crushing effect. An

surely, the opportunities for service are great; yet opportunity begets responsibility. Shall we respond to popular demands?

Our colleges enjoy special privileges bestowed upon them by the State, and are in a sense autocratic institutions by virtue of the fact that they, and they alone, can arrange courses of study which, when completed, will render the graduate qualified to practise. The question which ought always to confront the governing bodies of such institutions is that of the sufficiency of the curriculum of studies. There must be progression or retrogression. No intermediate status is possible.

Dr. William Hopkinson (Milwaukee), in his presidential address before the Wisconsin State Dental Society, *Dental Review*, (November), says: "Mechanical dentistry must, and always will, be a major part of our dental education, but many of us have been compelled within the past year to realize the serious relationship of medical dentistry to the general health of our patients. We realize that the demands of the times is for a higher standard, that study and research have developed the general inter-dependence of all bodily tissues and their functions, that dentistry is a special department of medical science and embraces the structure, function and therapeutics of the mouth and its organs, together with their surgical and prosthetic treatment. The time has passed when he who assumes the care of the mouth, and thus guards and protects the main portal of the entire organism, can feel that his work is accomplished by filling cavities and inserting teeth."

This expression of opinion by Dr. Hopkinson clearly implies that without letting go of the mechanics of dentistry we should teach more of the medical science, or in other words, dentists ought to be "taught medicine in so far as it is applicable to the specialty of dentistry."

Dr. Weston A. Price (Cleveland) also sees a broader sphere of activity opening up for the dentist. In his address before the Illinois State Dental Society, May, 1915, he says: "Chronic disorders are largely the result of a focus of infection which may themselves be very slight, but there is a definite focus of infection in some part of the body, and of all districts of the body where a focus of infection is likely to occur, the mouth seems to be universally the most common and the most frequent. Where does that put the dental profession?"

Some of the most vexing problems for dentists involve in their solution a special knowledge of pathology and bacteriology. Where shall we find the men to do research work? Can we reasonably expect a student taking a general course in dentistry to acquire this special information? Hardly! Are we to expect new graduates to immediately take up these problems of dentistry? Again we answer in the negative, because under the conditions which obtain to-day a student upon graduation most likely is in debt owing to the expense of his tuition to which burden must be added an additional one, the

cost of his office equipments. His immediate problem then is a financial one. We turn then to our third and last likely source—the established practitioner. A successful practice involves long and diligent work. The dentist seeks rest during his evening hours. Can we impose upon him laborious research work? Possibly a few enthusiasts do not object to beginning work anew in the evening, but most do. Clearly the wisest plan is to induce men who have special talents along particular lines and who have had clinical experience as well, to devote the major part of their time to some branch of dental research work, for which there must be provided adequate compensation. That such a plan will be productive of good results is evidenced by the work of the various research departments now being conducted in connection with several of the leading universities of the United States, reports of whose work reach us almost daily.

There seems to be great need of co-operation between those having experience as practising dentists with full knowledge of conditions of the mouth, and those having laboratory experience. When such a relationship obtains there is less likelihood of a laboratory researcher going out of his way to force views upon the profession which at the outset seem to be, and in practice usually prove to be, ridiculous.

Dr. M. L. Rhein (New York), in a discussion of this subject, *Cosmos* (November), says: "It is unfortunate to have a good laboratory investigator try to use his laboratory technique in a field with which, clinically, he is ignorant. It is on this very account that a great many of our best laboratories have refused to take up the investigations of dental subjects. They have frequently said to me: 'If you wish to obtain practitioners of dentistry trained to do laboratory work to go into our laboratory, we are perfectly willing to work out the topic. There is no one in our laboratory who understands the mouth properly, and consequently one who is fit to handle the subject.'" Many objectors to this view of the situation will say that it is not the purpose of a college to develop specialists, but rather to graduate good practitioners. There is good reason in this view, yet can we say that our colleges are doing even this well? One of the strongest indictments of the dental profession comes from a dentist. In the November issue of *Dental Cosmos* appears an article by Dr. James R. Cameron, resident dental surgeon, Episcopal Hospital, Philadelphia. He says: "The lack of pathological knowledge and of the practise of asepsis in many dental practices is appalling. One of the best known surgeons of the city of Philadelphia, a man of international reputation, in speaking before the clinical society of this hospital, said: 'The dentists as a class know very little about acute infections of the oral cavity, and less about asepsis.'" Again Dr. Cameron says: "What a broad field presents itself to the every-day practitioner of dentistry to combat malignancy." The man who cannot make a reasonably correct diagnosis of a malignant condition

in the oral cavity or associate parts is indeed a very poor representation of modern dental surgery." These statements are not new, but rather old ones emphasized perhaps a little strongly; but then it is just a judgment of ourselves by one of ourselves! In support of the claim that many dentists know little about sepsis, Dr. Cameron says: "Many practitioners of dentistry boast that they never sterilize their instruments. It would be of interest to know just how many people have been inoculated with syphilis by this class of practitioners. Cases, suffering from syphilis, have been reported to this and other hospitals, all evidences pointing towards the dentist as the disseminator. Baldwin, of Chicago, reports nine cases of syphilis contracted during dental operations, in two of which dentists themselves became infected through carelessness."

Whatever may be the difficulty in training our students to become expert in bacteriology, etc., there should be no half-measures adopted in making sure that our graduates know enough about asepsis and are sufficiently intelligent to practise them. But to return to the question as to the status of dentistry during the next decade. The future of dentistry lies apparently with those men who have a knowledge of the mouth conditions as a dentist finds them; who are skilled in laboratory technique, and have a sufficiently broad education to draw the correct conclusion from scientific experimentation, or to quote Dr. M. L. Rhein, "Clinical knowledge is just as important as is laboratory research work; the two factors must be combined by men of the proper mental acumen to be able to understand both factors." Are our dental colleges prepared to develop just such men, or will the coming generation have to apply fresh paint to that old sign, "Situation Vacant"?

Extensive Manufacturers' Exhibit.

AN announcement of interest to the dental profession has been made concerning an elaborate exhibit of dental office equipment, furniture, materials and instruments, at the Hotel Auditorium, Chicago, on April 4th, 5th, 6th and 7th, 1916.

While this meeting is primarily a manufacturers' exhibit, preparations are under way for a special development of the scientific side of the meeting, with numerous table clinics and demonstrations under the direction of the men who conduct the Manufacturers' Laboratories, assisted by expert demonstrators and lecturers.

The meeting will no doubt offer much of educational value to the practising dentist, and the sessions should be taken advantage of by members of the profession who can arrange to attend.

Maritime Dental News.

REPORTED BY GEORGE K. THOMPSON, D.D.S., HALIFAX.

DR. RALPH H. WOODBURY has been appointed Government representative to the School Board of the City of Halifax.

In the School Board estimates appears \$1,000 for dentistry and eye treatment.

The Halifax Dental Society has recommended the appointment of a Dental Inspector for the Schools of the City of Halifax.

Lieut. Karl F. Woodbury, C.A.D.C., has been detailed to No. 7 Stationary Hospital, the University of Dalhousie unit authorized by the War Office, and which will probably sail about January 1.

Lieut. Woodbury is the youngest son of Dr. Frank Woodbury, Provincial Representative on D.D.C., and graduated from the Dental Department of the University of Dalhousie last spring.

The organization of the Home Service branch of the C.A.D.C. for the 6th Division is proceeding satisfactorily. Capt. Geo. K. Thomson is officer in charge.

Hon. Captain Jas. M. Magee and Otto Nase have received appointments as Captain and Lieutenant respectively.

Toronto Rifle Club.

A VERY interesting meeting of the Toronto Rifle Club was recently held at the Dental College, when a constitution was adopted and the question of drill and rifle practice thoroughly discussed.

Officers were elected as follows:

Captain—Arnold Semple.

Secretary—Geo. P. Phillips.

Treasurer—Sydney W. Woollett.

Executive—W. H. Reid, I. F. Kruger, E. A. Peaker, Geo. G. Jordan.

Auditors—T. A. Currie, A. J. Broughton.

National Association of Dental Faculties.

THE National Association of Dental Faculties will hold its next meeting at the Seelbach Hotel, Louisville, Ky., July 22nd and 24th, 1916. Charles Channing Allen, Sec.

National Dental Associations.

THE National Dental Association will hold its twentieth annual session at Louisville, Ky., July 25, 26, 27 and 28, 1916. Headquarters will be the Seelbach Hotel.



Complimentary copies of Oral Health will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

CANADIAN ARMY DENTAL CORPS Overseas*

Lt.-Col. J. A. Armstrong.
Major O. K. Gibson.
Major A. A. Smith.
Capt. J. W. Bell.
Capt. C. Brown.
Capt. J. F. Blair.
Capt. G. N. Briggs.
Capt. W. J. Bentley.
Capt. G. S. Cameron.
Capt. O. A. Elliott.
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Capt. W. R. Greene.
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Lieut. J. F. Shute.
Lieut. D. P. Stratton.
Lieut. R. C. H. Staples.
Lieut. E. S. Tait.
Lieut. A. E. Thornton.
Lieut. H. P. Thompson.
Lieut. H. P. Travers.
Lieut. D. D. Wilson.
Sgt. Jas. G. Roberts.
Sgt. J. W. Macdonald.

Concentration Camps

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Capt. S. H. Simpson.
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Lieut. C. M. Joyce.
Lieut. W. J. McEwen.
Lieut. J. A. Stewart.
Lieut. V. D. Wescott.
Lieut. G. A. Wilcox.

Divisional Officers

Capt. A. Dubord.
Capt. H. T. Minogue.
Capt. F. P. Shaw.

Capt. W. G. Trelford.
Capt. Geo. K. Thomson.
Capt. W. G. Thompson.

Capt. F. M. Wells.
Capt. J. M. Wilson.
Capt. W. W. Wright.

*Acting Chief Dental Surgeon, address, Ottawa.

*Lieutenants rank as Captains while overseas.

C.A.D.C. overseas address—Care Chief Dental Surgeon, Canadian Expeditionary Force, Folkestone, Eng.



ATTACHED TO CORPS OTHER THAN C.A.D.C.

Overseas

Major F. P. Hollister, 12th Batt.
 Major F. T. Conlan, 22th Battery
 Capt. K. C. Campbell, 45th Batt.
 Capt. Chas. A. Corrigan, Army Service Corps
 Capt. E. B. Sparks, Queen's Univ. Hosp., *Edin.*
 Capt. J. L. McLean, 59th Batt.
 Lieut. A. H. Logan, 38th Batt.
 Lieut. H. J. McLauchlin, 41st Batt.

Concentration Camps

Lieut. Colonel E. F. Armstrong, 10th Batt.
 Major H. A. Croft, 10th C.M.H.
 Major Neil Smith, 51st Batt.
 Capt. A. L. Johnson, 68th Batt.
 Lieut. C. E. Wright, 80th Batt.
 Private D. W. Moore, 100th Batt.

UNDERGRADUATES

Overseas

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P. H. Barry, C.A.D.C.	A. G. Lumball
A. Chambers, C.A.D.C.	E. B. McArthur, U.S.M.H.
E. H. Dixon, 71st Batt.	C. F. McCann, C.A.D.C.
J. E. Doran, C.A.D.C.	H. H. McGuire, American Hospital
J. E. Irwin, C.A.D.C.	H. V. McLaughlin, U.S.M.H.
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H. B. Legate, C.A.D.C.	R. H. White, U.S.D.C.

Concentration Camps

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H. Greenwood, 76th Batt.	J. S. Pilling, C.A.M.H.
F. H. Hutchinson, U.S.M.H.	J. J. Egan, C.A.M.H.
J. T. Irwin, 4th U.S.	

HONOR ROLL

Major C. H. Hale, 100th Batt., 1st Division

Oral Health will appreciate receiving names and addresses or other information that will make these pages a complete record. Records should be constantly available to every member of the profession.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

METHOD OF IMPROVING POLISHING STRIPS.—If both sides of polishing strips are drawn over a piece of paraffin wax before using they will work better and more rapidly, and will not be spoiled by moisture. This improvement is most marked in strips of coarse grain.—*La Odontologia Colombiana.*

CAVITY TOILET PREPARATORY TO THE INSERTION OF SYNTHETIC PORCELAIN.—The toilet of a cavity preparatory to the insertion of a synthetic porcelain filling must be as thorough as if a metal filling were to be used. To the ordinary toilet should be added the varnishing of the dentinal walls as a precaution against the material absorbing either acid or moisture from the walls or against the absorption of part of the fluid from the material by excessively desiccated dentine. Usually the rubber dam should be applied.—*C. Davis, Western Dental Journal.*

TAKING IMPRESSIONS IN PERSONS WHO HAVE WORN DENTURES BEFORE.—It has been observed that, after a person has worn a denture (especially one of vulcanite) for some time, the mucous membrane swells slightly. This is the reason why new dentures often do not fit satisfactorily in such cases. As the mucous membrane returns to normal condition within about twenty-four hours, if no plate is worn, the patient should be requested to go without a denture for that length of time before a new impression is taken.—*La Odontologia Colombiana.*

DEATHS FROM ANAESTHETICS.—The annual statistics of births, marriages and deaths, as published by the general registrar of London, present the following interesting data: During 1914, 296 casualties were connected with or directly due to anaesthetics, thirteen cases more than in the previous year. In 111 cases the anaesthetic is not specified. Of the remainder, 110 deaths were due to chloroform, 25 to chloroform and ether; seven to alcohol-chloroform-ether sequence; seven to nitrous oxid; five to ethyl chlorid; two to hedorial; two to cocain; two to alcohol and chloroform; one to stovain.—*La Odontologia.*

ORAL HEALTH

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Vol. VI.

TORONTO, JANUARY, 1916

No. 1

EDITORIAL

Dental Research in Canada.

THERE is no more important work before the dental profession of Canada than the organization and direction of Dental Research. The National Dental Association of the United States has, through its Research Commission, accomplished magnificent work during the past two years. The attainments of this body are at once a boon and an inspiration to Dentistry throughout the world.

How can the dental profession of this Dominion best initiate and direct Dental Research? Canadian dentists have discussed the problem upon many occasions, and there seems to be a growing disposition to look to the Dental College for leadership in this important matter. Dalhousie, Laval, McGill, and the Royal College of Dental Surgeons, working under some co-operative plan to prevent needless duplication, could accomplish much in Dental Research with a minimum of expense. The colleges need not be expected to bear the whole burden of the work, but could call to their assistance, on occasion might demand, members of the dental or other professions who have the ability and inclination to help. A tremendous advantage would accrue to dentistry through the influence of such a move-

ment upon the younger members of the profession and upon the undergraduate body generally. Many students pass through our dental colleges to-day without having either acquired the "reading habit" or received an inspiration to work toward the solution of the many unsolved problems of the profession.

As evidence of what may be accomplished for Dental Research through the agency of the Dental College, the work of Dr. Harold K. Box, of Toronto, is of interest. Dr. Box was appointed R.C.D.S. Fellow at the time of his graduation in the spring of 1914, and was engaged for whole-time all-year service, working under the direction of Dr. Joseph Graham, Department of Pathology. During the year, extensive work was done, covering the histology and pathology of the dental pulp. Hundreds of microscopic slides were prepared, showing the progressive and retrogressive pathological changes that occur in the dental pulp. Dr. Box also found time during the year to make certain bacteriological studies, and, following Naguchi's technique, cultured pure fusiform bacilli.

Upon reporting the work of the year to the Board of Directors at the annual meeting in the spring of 1915, Dr. Box was invited to continue his research and was appointed for half-time all-year service during the past year. This action of the Board has been abundantly justified. The work of Dr. Box during the past year has embraced studies on the peridental membrane, normal dentine and alveolar process. The innervation of dentine has long been a controversial subject among histological authorities and investigators. It has been held that sensation in dentine is due to the protoplasmic content of the dentinal tubule rather than to the presence of actual nerve processes extended from the pulp. Dr. Box, however, has recently completed microscopic work which would seem to prove conclusively the presence of actual nerve fibre in dentine.

Dr. Box's work during the past two years is of such outstanding value to science and dentistry that it is to be hoped the Board of Directors of the Royal College of Dental Surgeons will publish in pamphlet form the report of Dr. Box's work and thus make it available to the entire profession.

Members of the dental profession in Canada are certainly more virile than to sit idly by while their American confreres unselfishly spend their money and sacrifice their time and energy in an effort to bring light and understanding to many things that are now dentally obscure. Otherwise, Canadian dentistry would play the ignoble part of a sponge, profiting by all that others bring without adding its own quota of helpful service. Just as Canada believes in "playing the game," so Canadian dentistry, with the blood of youth in its veins, will bear its own proper share of the research burden and make what sacrifices are necessary for the early establishment of an aggressive organized plan for Dental Research.

Oral Hygiene Reports.

WATERBURY, CONN.

The matter of oral hygiene, the care of the mouth and teeth as a preventive of disease, is just now receiving special attention from the Waterbury Women's Club, which is asking that an appropriation of \$4,000 be included in the municipal budget for the purpose of providing for the first and second grade Public School children adequate dental inspection and work.

The report of the work so successfully done in Bridgeport is very enlightening. It shows the importance of a clean mouth, so that clean food, for which so much is being done by health authorities, shall do its proper work in the nourishment of the body, and how the number of cases of disease among school children has been materially lessened by proper care of the teeth. The tooth-brush drills are described, and the report is one which should be of real interest to all who are responsible for the care of children.

Waterbury has plenty of good dentists, who are thoroughly informed concerning the latest developments of their branch of medical science, and who will be able to plan satisfactorily for thorough inspection of the mouths of the younger school children and such dental work as may be found necessary. They will be ably assisted in this work by the Public School teachers, and there is no reason why the good results obtained in Bridgeport and other cities should not be duplicated here. Bridgeport began by appropriating \$5,000 and has increased this appropriation to \$12,000. Waterbury, with a smaller school population, is asked for \$4,000 to start the work.

CINCINNATI ORAL HYGIENE WORK.

THE "Oral Hygiene Week" campaign of the Cincinnati Dental Society closed at the University of Cincinnati with a lecture to the Association of Collegiate Alumnae by Dr. Harvey W. Wiley, of Washington, D. C., pure food expert.

Dr. Henry German, President of the Society, is reported to have said: "The campaign was a huge success. Fifty thousand school children were each provided with a tooth-brush and taught how to use it properly.

"The most important thing to be done now is to follow up the work, and that will devolve upon the parents and teachers."

Dr. Wiley also spoke at a meeting of the City Club in the Hotel Gibson. He called the members of the Cincinnati Dental Society public benefactors. He said that when he visits friends they ask him to look at their children's teeth instead of calling attention to the facial beauty of the tots.

"That's the modern, beneficial spirit. The greeting of the future will be not 'Good morning, how are you to-day?' but 'Good morning, how are your teeth?'"

Dr. Wiley told the clubmen that there were probably three or four dozen among them with mouths that needed instant attention, which were not causing their owners any serious inconvenience, but nevertheless were a constant menace to the health.

The Tooth Brush.

IT may be true that the adoption of simple habits of living and the thorough mastication of properly selected food would ensure a condition of health for the gums and teeth of the human race. One would, of course, have to presuppose normal alignment, occlusion and contact. But how many such cases are found in practise? How many people in this busy age live the "simple life," properly select their food, or thoroughly masticate it? Modern methods of living are far from nature. They are artificial, and artificial means must be employed to obviate the distressing results, one of which is the increased susceptibility to dental disease.

Of all the artificial tooth cleansers, nothing has yet been devised for general use that equals the much-maligned tooth-brush. The tooth-brush certainly has many faults, but its efficiency is proven in the condition of the teeth of the people of Canada and United States as compared with countries where the tooth-brush and good dental care do not prevail to the same extent.

Let us not only encourage the use of the tooth-brush, but make sure that our patients are so instructed that the brush may be carefully selected and used intelligently without injury to the parts to which it is applied.

Mayor W. D. Cowan.

ORAL HEALTH extends to Dr. W. D. Cowan, Regina, hearty congratulations upon his election to the Mayoralty of his home city.

Dr. Frank E. Bennett.

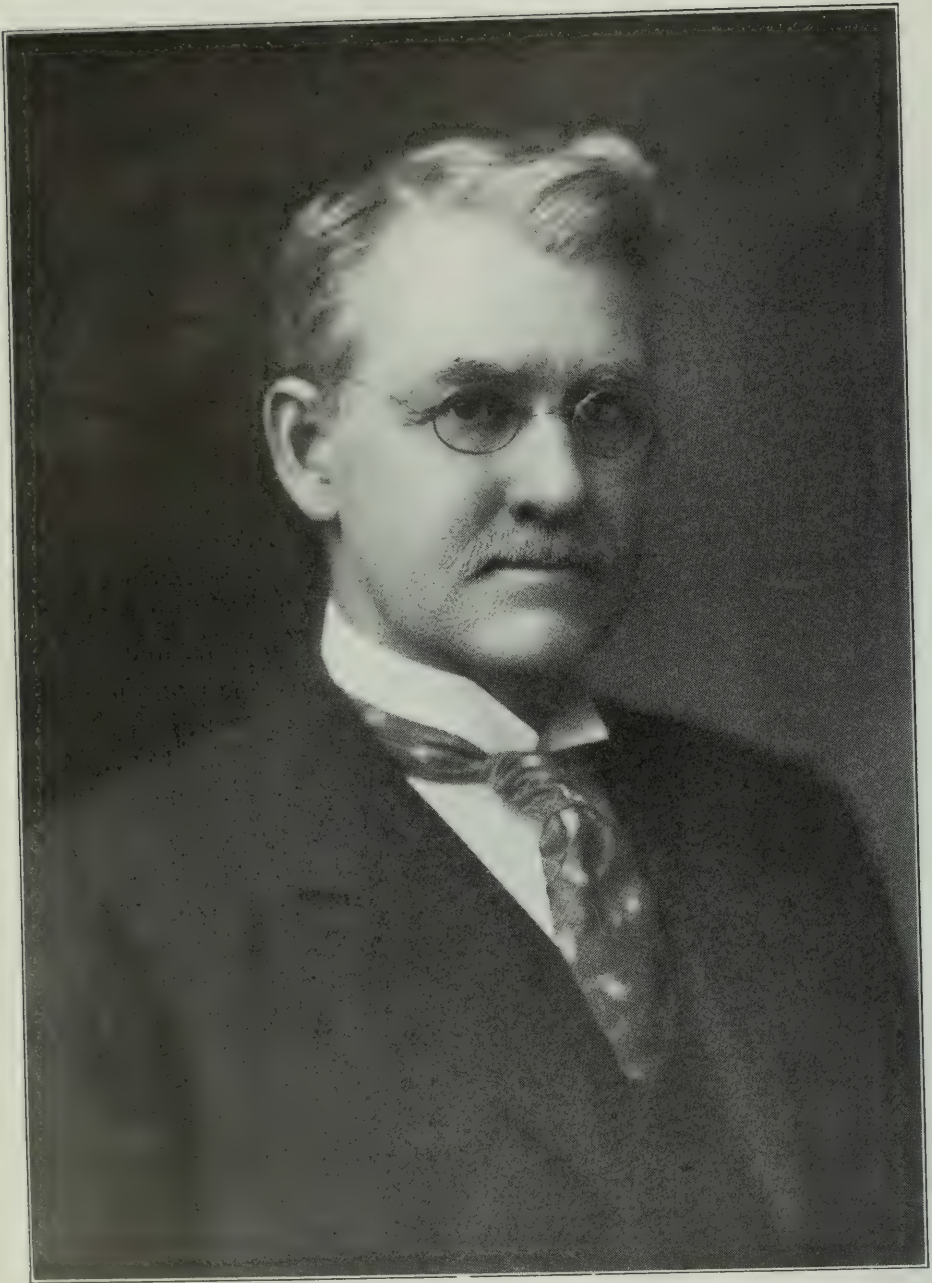
DR. BENNETT has been re-elected to the Board of Education, St. Thomas, receiving the greatest number of votes cast for any candidate in the recent municipal elections. Dr. Bennett was chairman of the Board last year, and has done much for Oral Hygiene in the Public Schools.

Preventive Dentistry A New Field of Medicine

FOR years dentists have been preaching the importance of a healthy mouth and sound, clean teeth, but their arguments were based chiefly on the danger of losing the teeth and on possible dyspepsia and other digestive disturbances due to the imperfect mastication and the scattering of germs and poisons from decayed teeth. Now, however, their arguments are greatly reinforced by the physicians who are directing to the patient's teeth the attention they used to pay to his tongue.

This is because bacteriologists have discovered that the same germ which causes decay and pus formation in the roots of the teeth may also cause such widely different diseases as GASTRIC ULCER, subcutaneous inflammation of the kidney, or various kinds of joint inflammations. A suppuration at the root of a tooth may not even cause distress, yet the germs from that little focus may escape, into the general circulation and lodge in kidney, heart or bone. The most astute physician, when he sees a case of acute inflammatory rheumatism, looks first at the gums. And if he finds no trouble there, asks for an X-ray of the teeth.

This gives to the care of the teeth a much greater importance than has hitherto been given.



DOCTOR THOMAS L. GILMER
Chicago, Illinois

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, FEBRUARY, 1916

No. 2

Chronic Oral Infections and Their Relation to Diseases in Other Parts.*

THOMAS L. GILMER, M.D., D.D.S., Sc.D.

THE knowledge of focal infection in the mouth and jaws as a cause of systemic disturbances is by no means new. Many years before the advent of bacteriology, medical men often recognized the impossibility of curing patients having certain chronic disorders until their mouths were freed from infection. The prevailing method of treatment of disease dependent upon lesions of the gums and teeth at that time was the removal of the teeth. It was observed that after the mouth was freed from disease there frequently followed prompt recovery of patients from chronic physical disturbances, which before were incurable by other treatment.

The association of the mouth with systemic disorders at that early day was the result of observation, and not from any scientific knowledge in regard to the subject. Bacteriology, as a science, had not then been demonstrated, and even after the development of bacteriology into a fixed science, many years elapsed before a close connection was made between cause and effect.

In a series of articles by Miller in 1891, entitled "The Human Mouth as a Focus of Infection," he said (*Dental Cosmos*, Sept., 1891, page 689): "During the last few years the conviction has grown continually stronger among physicians, as well as dentists, that the human mouth as a gathering place and incubator of pathogenic germs performs a significant role in the production of varied disorders

*Read before Toronto Dental Society, 1915. JOURNAL, 1916.

of the body, and that if many diseases whose origin is enveloped in mystery could be traced to their source, they would be found to have arisen in the oral cavity." These articles, written a quarter of a century ago, were prophetic of facts now demonstrable.

In 1904, Frank Allport, of Chicago, read a paper before the Chicago Dental Society, entitled, "The Relation of Odontology to Ophthalmology and Otology," in which he quoted from various ophthalmological and other medical journals, citing numerous cases of eye diseases which were secondary to jaw infections. (*Chicago Dental Review*, April, 1904.)

In 1906, Osler gave your own Hunter credit for having first called attention to oral infection as a cause of systemic disorders, and then made this statement (*Osler Practice of Medicine*, 6th edition, page 440): "Of the twenty cases of pernicious anemia which I had under observation in 1904, pyorrhea alveolaris was present in more than half." He further said: "Certain types of nephritis are also believed to be due to oral infection."

Mr. Hunter, of London, delivered an address at the opening session of the Faculty of your McGill University, Montreal, October 3, 1910, entitled, "The Role of Sepsis and of Antisepsis in Medicine." (*The Lancet*, London, England, January 4, 1911.) In this address he cited numerous cases of systemic disorders which were directly traceable to oral sepsis, and criticized "American conservative dentistry" in severe terms. He also criticized medical men for looking everywhere except the right place—the mouth—for the cause of certain diseases. Some American dentists were highly indignant at this severe arraignment by Mr. Hunter, and retorted in a manner which, in the light of subsequent events, has made them appear in an unenviable light.

It was not until Billings, of Chicago, and others, in more recent years, systematically took up the subject and connected the clinical findings with scientific bacteriological demonstrations, that the true relationship existing between oral foci and systemic diseases were made manifest.

Billings associated with himself in this work Davis and Rosenow, bacteriologists, of Chicago, the latter now of the Mayo Foundation, Rochester, Minnesota. The work of these men has created widespread interest in the subject and much good is resulting. Many valuable reports have been made by them and investigations are still going on, developing new and interesting facts.

Among their first work, diseased tonsils were subjected to bacteriological examinations, cultures made from the prevailing organisms isolated and animals inoculated. Joint, muscle, stomach, kidneys and heart lesions were demonstrated in these animals after death. The organisms, principally a streptococcus, regained from the animal lesions were found to be the same as those isolated from the diseased tonsils. Later it was found that abscessed teeth gave the same

organisms, and these were found to produce on animals similar results to those taken from tonsils.

Billings says (*Journal of the American Medical Association*, May 1, 1915, page 1524): "Acute rheumatism has long been recognized as an infectious disease. The organism has been designated as *Streptococcus rheumaticus*, *Diplococcus rheumaticus*, or *Micrococcus rheumaticus*. With the phenomenal work done by Rosenow in connection with new methods of bacterial culture in our clinic, we practically always find the organisms in the exudate or in the tissues of the patient. We can then make a culture of it, can inject it into animals, producing the disease, and we can recover it from the animal again. Acute articular rheumatism is an infectious disease, due to a form of streptococcus; that streptococcus is specific in the production of the syndrome we call acute rheumatic fever, just as the pneumococcus is in producing ordinary lobar pneumonia. It has been proved by investigation that the organism in both acute and chronic rheumatism is hematogenous in its method of infection; the organisms passing through the smaller blood vessels of the tissues are caught by the endothelium of the vessel, producing cellular proliferation and obstruction of the blood vessel, so that in acute conditions one finds the blood vessel obstructed with minute hemorrhages at that point into the infected tissue."

In 1911, Billings, Davis and myself, in a symposium in the Chicago Medical Society, presented papers on focal infections. I quote the following from my paper (*Chronic Oral Infections, Archives of Medicine*, April, 1912, vol. 9, pp. 499-504). "Chronic alveolar abscess is so common that few go through life without one or more such suppurations. There are two forms of this disease; that which continually or periodically discharges either into the mouth, nose, maxillary sinus, or elsewhere, and the blind abscess which never discharges through a sinus, the pus being absorbed by the granulating walls of the abscess. The former, discharging pus and bacteria as indicated, cannot but be prejudicial to health, and the latter, the blind abscess, offers greater danger. Its presence is generally undetected by the patient and may be overlooked by the physician, even if the mouth is ocularly examined, since it may not present to the eye the clinical evidence of its presence. I think twenty-five per cent. a safe estimate of the percentage of jaws having suppurating cavities. That greater havoc is not wrought by such focuses of infection is due either to the fact that the dosage of bacteria and their poisons is usually insufficient, or to the fact that the normal individual becomes immune to the bacteria. Instances, however, are not lacking which demonstrate that such focuses of infection are instrumental in causing neuritis, neuroses and secondary infections of the eye, ear and other parts; therefore, when there are manifestations of disease which may be dependent on some local focus of infection, the mouth and jaws, as well as other possible sources, should be examined to discover if they may not hold the key to the solution of the problem.

"The question which has not been answered, but must and will be, is: What is the bacteriology of chronic alveolar abscess? When this question and the question of susceptibility and immunity are answered, we can better understand the relation which these pathological cavities in the maxillae bear to lesions in the heart, kidneys, lungs, nerves and brain. Here are possibilities not to be ignored. Did similar abscesses exist in other bones of the body, their presence would demand immediate attention, both by the patient and the physician. Alveolar abscess is usually considered inconsequential, and when the attention of the profession has been called to it, it has generally excited little interest, and has been allowed to pass as an insignificant 'gum boil.'"

The etiology and pathology of alveolar abscess is so well known that its recitation in this paper would be superfluous. Its prevalence and dangers are now well recognized, and a more extended observation leads me to conclude that the above estimate of twenty-five per cent. for adults having chronic alveolar abscess is too low. In many instances these abscesses are not discoverable except by the aid of the radiograph, and in some instances the infected area is very small, but no matter how small the area involved, the danger may be quite serious.

In the quotation previously made from my paper on "Chronic Oral Infections," I said: "The question which has not, but must and will be answered, is, What is the bacteriology of chronic alveolar abscess?" At the meeting of the American Medical Association in 1914 (A Study of the Bacteriology of Alveolar Abscess and Infected Root Canals, Gilmer and Moody, *Journal of the American Medical Association*, Dec. 5, 1914, Vol. 63, page 2023), Moody and I attempted to answer this question in a report of a short series of examinations made by us at St. Luke's Hospital Laboratory, and a similar study has since been made by Hartzel ("The Clinical Type of Arthritis Originating About the Teeth," *Journal of the American Medical Association*, 1915, LXV. 1093). We examined specimens from sixteen acute alveolar abscesses, eighteen sub-acute or chronic abscesses, and eight specimens from the root canals of abscessed teeth. In this series of forty-two cases we found the predominating organisms to be streptococci. We obtained many graded varieties from a hemolytic streptococcus with a wide zone of hemolysis in acute abscesses, to a streptococcus viridans in the chronic form. In one instance we found the streptococcus mucosus was the prevailing organism. After the report of this series, we made other examinations with similar results. We are now making a more extended study of chronic jaw abscesses with animal inoculation and passage. A partial preliminary report is appended below.

Unless the greatest care is exercised in the collecting of material for culture work the results will be valueless. In Moody's and my work the gums about the abscessed tooth and those adjoining are

thoroughly cleansed with alcohol, a steril instrument is used to remove the tooth, and as it is removed it is not permitted to touch any part of the mouth. A steril pipet drawn to a fine calibre and sealed with heat is used to collect the specimen, its large end being plugged with steril cotton. The sealed end is broken off and flamed, and the material from the apical portion is sucked into the pipet and the opening sealed by fusing the glass. It then goes direct to the laboratory for culture.

Here is the preliminary report referred to above, made for me by my associate in this work, Dr. A. M. Moody, bacteriologist, St. Luke's Hospital. This study is being made for the purpose of determining, so far as possible, the effect on animals injected with strains of freshly isolated streptococci from chronic alveolar abscesses. In this work strains of streptococcus viridans, isolated from alveolar abscesses in fifteen patients suffering from various pathological conditions, have been injected into a total of forty-seven rabbits. A complete report of this work will be ready for publication in the early summer.

Since the results of these histological examinations are identical with those published in 1914 by Gilmer and Moody, it does not seem that a complete statement is necessary at this time. This much is true, that the streptococcus viridans in every instance is the predominating organism, and that in only one instance was the staphylococcus found, and then just an occasional colony was present.

Of the fifteen patients with chronic alveolar abscesses six had also pyorrhea; eight had rheumatism, one each acute gastric ulcer, neuritis, myocarditis, mitral endocarditis, and nephritis. Rosenow's technique, in a large measure, has been followed in these studies. The exceptions are two, i.e. (1) The doses of streptococci have, in all instances, been less than two billion, and in most cases between one-half and one billion. These are approximate numbers. (2) The animals have been allowed to live a longer time after injection.

The gross pathological lesions present in the forty-seven rabbits are given below. The microscopical examinations of these have not as yet been completed, but in so far as these observations have progressed, the gross diagnoses have been confirmed. Following the table of Rosenow in the animals autopsied:

Appendicitis was present in	2%
Hemorrhage of stomach	40%
Ulcer of stomach	13%
Ulcer of duodenum	2%
Hemorrhage or pus in gall bladder	13%
Hemorrhage in pancreas	15%
Hemorrhage into Peritoneum	5%
Arthritis and periostitis	40%
Endocarditis	28%
Pericarditis	5%

Myocarditis	5%
Nephritis	30%
Hemorrhages or other lesions of the lungs	10%
Hemorrhages into the skin	2%
Tongue	0%
Eye	4%
Hemorrhages into jaw	20%

The hemorrhages into the jaw have not been previously described, except in a paper on experimental scurvy by Jackson and Moody before the American Association of Pathologists and Bacteriologists in St. Louis, April, 1915. These hemorrhages occur beneath the periosteum of the lower jaw before the central incisors. Occasionally they occur on only one side, but may be present on both.

This series is too small to draw any definite conclusions. They, however, indicate a certain amount of selective localization for the streptococcus viridans isolated from chronic alveolar abscesses. To be more specific, these organisms produced gross evidences of muscle involvement in 60%, joint and bone, aside from the jaw, in 40%; stomach in 40%, kidney in 30%, and jaw in 20%.*

We occasionally find what I have termed atypical alveolar abscesses, the lateral abscess of black on the sides of the roots of teeth having live pulps.

Black believed that these abscesses were due to acute pyorrhea alveolaris attacks, the infection extending from the gingival border root-wise through a narrow channel on the side of the root.

Since Moody and I have found in 20% of our cases sub-periosteal hemorrhages in the jaws, I am inclined to believe that similar hemorrhages may be found in the peridental membrane. If hemorrhages are caused by the streptococcus in the periosteum, may it not cause a like condition in the peridental membrane as well?

Since the area involved in hemorrhage may later become abscessed, then if the peridental membrane participates in like hemorrhages we have a seeming scientific solution of the atypical alveolar abscess. As yet we have not examined the peridental membrane for hemorrhages, but intend to look for them in this organ.

Rosenow's work is the most interesting of all that has been done in connection with the subject of focal infections. Reports of much that he has done may be found in the *Journal of Infectious Diseases* and the *Journal of the American Medical Association* in the past three or four years. Rosenow says (*Journal of the American Medical Association*, May 1, 1915, page 1524): "The demonstration of streptococci in the focus of infection at the time of an attack of appendicitis that has affinity for the appendix when injected intravenously into animals, it seems to me, is good evidence, together with all the other facts, that the growth of the organism in the throat or in the focus of infection is primary, and that the disease in the

*The above experimental work was done in St. Luke's Hospital Laboratory.

appendix is a result of this, not by the swelling of bacteria, but by embolic infection, getting into the circulation and finding in the appendix a favorable spot for growth."

He further says: "We have heard much in regard to the importance of various foci of infection. The breaking of the continuity of surface, the epithelium of the skin, the breaking of the continuity of mucous membranes anywhere should be regarded as a serious matter. We know the relationship of slight abrasions to highly virulent streptococci infection. After demonstrating the presence of bacteria of low virulence in this type of infection in cases of cholecystitis and appendicitis, why not believe they are also important? The focus is not only the place of entrance, but also the infection atrium. The transmutation of streptococci has been established. In one instance there is an affinity for joints, in another for the appendix, and in still others for the stomach and the gall-bladder. These types of streptococci are so much alike in their cultural characteristics and morphology that it is difficult to differentiate them; but when injected as isolated, they are different in their actions in animals."

The radiograph is essential to the best understanding of the condition of the jaws. The faradic current, as recommended by Prinz, is the best method of definitely determining the life of the tooth pulp, provided it is not too much enveloped by gold or other metals. To radiograph teeth having live pulps, in seeking out jaw abscesses, is an unnecessary expense to which to subject a patient, and the extent of pyorrhea pockets may usually be determined very accurately by the use of delicate steel probes. All teeth having dead pulps, which promise any hope of being saved, should be radiographed for the purpose of determining the presence or the absence of root fillings, the extent of the abscessed area, if present, and the extent of the destruction of the peridental membrane. If the apical area involved is inconsequential, then treatment may be undertaken through the pulp canal by medication. If the apical portion of the root is denuded of its normal investment, even to a slight degree, then that part denuded is dead tissue and must remain such, since the peridental membrane is an organ of specialized tissue, which when once destroyed is never reformed, leaving the denuded portion of cementum and dentine permanently necrosed. Unlike necrosed bone, the necrosed end of a root cannot be exfoliated. If too great an extent of the root be denuded of its peridental membrane to indicate treatment by medication through the root canal, then the necrosed part may be resected, the abscess curetted, and the usefulness of the tooth, in a majority of cases, be preserved. Unfortunately, this treatment is not equally applicable to all teeth. Resection is particularly applicable to the upper incisors, cuspids and bicuspidi; less so to the corresponding lower teeth, rarely to the upper molars, and practically never to the lower molars, owing to the anatomical relations.

If roots to be resected are infected or imperfectly filled, then these conditions should be corrected before the operation. All teeth whose periodontal membrane is largely destroyed should be extracted, as no treatment can cure such teeth.

As before said, any apical abscess, it matters not how small, is a source of danger. So long as vitality is high, the product of a small abscess may do no visible harm, but a slight trauma or a lowered vitality may change seeming immunity into susceptibility to even small dosages of bacteria, or their toxins, with secondary manifestations resulting, often of a very serious nature. If this is true, it is our duty to keep close watch over our patients and eradicate every focus of infection found in the mouth.

With knowledge of Rosenow's work on "Elective Localization of Streptococci," we can see the possibilities of the danger of these streptococcus infections of the jaws, and since the mouth is a part of the human anatomy, for which the dentist is especially responsible, a grave duty rests upon him. So far as possible he should prevent alveolar abscess and pyorrhea alveolaris, but if these diseases are present they should be eradicated, even if it necessitates the removal of the teeth involved. Teeth are valuable, but life and health are paramount.

I am skeptical about the permanent cure of pyorrhea alveolaris after deep pockets have been formed. If the pockets are not so deep, but that cutting away of the gums overlying will eliminate the pockets, we may, in some instances, by the combination of this with other treatment, preserve the teeth without jeopardizing the patient's health or life. I would emphasize the importance of completely eradicating the pus pockets, otherwise there can be no hope for a condition which is safe.

The radiograph is well recognized as an important aid to diagnosis in chronic jaw infections, but unless the pictures are skillfully made and properly interpreted, one may be led astray by them. The angle of the exposure of the film, in its relation to the light and the relation of the film to the tooth, are both important factors. The buccal roots of the upper molars, in some instances, appear to be within the maxillary sinus, because the light was superimposed to the floor of the antrum. Indeed, in many instances, it is difficult to make a picture of some of these teeth which will afford accurate information as to the condition of the apices of the roots. One should always remember that radiographs are simply shadow pictures, therefore show only the apical, mesial and distal parts of the roots.

A few of many similar clinical cases which have come under my observation will be cited later, which seem to indicate very clearly that mouth foci is instrumental in causing systemic disorders, since on the removal of the original focus of infection, the patients have fully recovered. It must not, however, be expected that all patients

with arthritis deformans and with other systemic disorders of long standing will be cured when the original focus is removed, so that there will be immediate cure on their removal, time and other treatment is often necessary.

I think it may be stated with considerable accuracy that the more chronic the condition, the greater the time necessary for a cure after eradicating the focus of infection; and also that in a majority of those cases which do not yield to the removal of the focal cause the condition has existed so long that changes have taken place in the organ or parts involved, which make it impossible for such organ or part to regain its normal state.

Vaccines have been quite extensively used in the treatment of various diseases, and in some instances marked improvement has been observed. No hope for help from vaccines should be expected, however, until the focus of infection has been removed, and even then the vaccines employed must be the right strain, otherwise no good should be anticipated, and even harm may be done by their use. The use of stock vaccines is only a guess that the right strain will be included among the various strains employed. Such vaccines are not unlike "shot-gun" prescriptions, in which a number of drugs are combined with the hope that some one of the ingredients may be the desired one needed to effect a cure.

Billings says (*Journal of the American Medical Association*, May 1, 1915, page 1524): "For acute rheumatism vaccines have been used. If we are going to follow any principle in treatment of vaccination, we must stop and ask what these vaccines are expected to do. In acute infectious disorders, vaccines have not proved efficacious. When the living organisms in the body do not excite enough antibodies, it is not reasonable to inject more dead bacteria into the tissue to excite the defences. Phylacogen or rheumophylacogen preparations are being used all over the country for rheumatism. In the advertisement of a certain pharmaceutical firm there is a report of 15,000 cases of rheumatism in which recovery ensued in 12,000 with the use of rheumophylacogen. I have been practising medicine for thirty-five years, and I have not seen patients die from acute rheumatism *per se*. I have seen them die from the sequelae, that is, of heart conditions, later in life, etc. My professional friends know that I have not a good opinion of these preparations."

Relative to stock vaccines, Rosenow says (*Journal of the American Medical Association*, May 1, 1915, page 1524): "It is absurd to hope to get good results from streptococcus vaccines bought at the drug store and using them for these various diseases. What good will streptococcus vaccines, manufactured by various commercial laboratories, do in each specific case? A vaccine should be developed and given for each specific disease. Only autogenous vaccines should be used. In order to have autogenous vaccines, the micro-

organisms must be proved; then you can proceed to treat the case intelligently."

A few cases which have come under my observation may serve to illustrate the baneful effects of focal infections of the mouth and the remedy which brought about a cure.

Mr. A., aged 76, had an attack of rheumatism of the ankle and joints of the foot. He came to my office by the aid of crutches. I found two teeth badly abscessed. These teeth were removed and good drainage secured. One week later he was able to walk without crutches. He has remained well after a period of seven months. The rapidity of this recovery is unusual, and a like rapid recovery should not be generally expected.

Mrs. R., aged 70, had had sciatica for a year. The ordinary treatment for such cases was not helpful. She had pyorrhea about most of her teeth. The pyorrhea pockets were so extensive that extraction of the teeth was indicated. Her sciatica was rather worse following the removal of the teeth, and it was not until six months had passed before she was free from pain. One year has elapsed since the extraction of the teeth, and for half of this time she has had no pain in sciatic region.

Mrs. B., aged 60, had arthritis and neuritis extending over a period of two years. No focus could be discovered other than in the mouth. Had many crowns and bridges. Mechanically, this work was well done. Abscesses at roots of several teeth, gingivitis about all crowns. Pockets between some of the molars. Roots had not been very successfully filled. Teeth were removed. Condition did not improve for six weeks, then gradual improvement for six months, when patient was freed from all pain and discomfort.

Mr. S., aged 26, referred to my clinic for surgical treatment of large abscess in the upper jaw resulting from infected tooth. Patient had temperature of 100°, was anaemic, skin pale, eyes dull; had not felt well for several months. Removed teeth and cleaned out large abscess in the bicuspid region. One week later patient much improved in appearance, temperature normal, color better. Two weeks later he was seemingly completely recovered.

Mr. K., attorney. Health steadily failing for five years. Was pale and anaemic, "extremely nervous and easily upset." Digestion poor. Might be considered a neuresthenic. Physician could find no focus of infection outside of the mouth, and sent patient to me for oral examination. My examination discovered deep pyorrhea pockets about several teeth and abscesses about the apices of others. One of the abscesses extended from cuspid to cuspid on upper jaw. Removed abscessed teeth and curetted abscess cavities. Extracted the worst pyorrhea teeth and treated those less affected. Improvement apparent in a short time. In three months was fully restored to health, and still remains so. Gained much flesh, and is no longer dyspeptic or "nervous."

It must not be forgotten that the primary focus of an alveolar abscess may at time be the tonsils, joint, or other part, and the jaw infection secondary to these. Sometimes an abscess forms at the end of a root, which has no relation to the mouth. In such cases the infection must be secondary, the organisms coming through the blood streams or lymphatics from a primary focus elsewhere.

Since dentists now know that mouth focuses of infection sooner or later may cause secondary manifestations of more or less significance in other parts, what will their attitude be toward the subject? Will they continue the retention of loose, incurable, pyorrhea-infected teeth? Will they continue the use of badly infected roots as piers for bridges? Will they ruthlessly destroy pulps in sound teeth that bridges may be inserted, knowing the difficulty of perfectly filling most roots, and the impossibility of filling some? Will they ignore the dangers from incurable abscessed teeth and retain them indefinitely in the jaws? Will they continue to set bridges which are unsanitary? These are pertinent questions for us all.

Resume of Discussion of Dr. Gilmer's Paper.

DR. McDONAGH, TORONTO:

DR. McDONAGH complimented the author upon the excellence of the paper, referring to the subject as being the all-absorbing topic among thinking men in both the dental and medical professions.

A summary of Dr. McDonagh's remarks follows:—Reference was made to the lack of dental instruction in medical colleges and the prediction made that when such conditions are corrected the medical profession will not be found swinging over from the extreme of entirely ignoring oral conditions to the other extreme of attributing every ill of the human body to mouth infections. Notwithstanding, however, there has seemed to be a disposition on the part of the public to take the word of the physician rather than the dentist, covering these matters, but such an attitude rapidly passes away as dentists more fully understand their responsibilities and opportunities.

In one of Dr. Gilmer's statements there is an inference that in order to have a haemolyzing organism we must have an acute abscess,—that if the abscess becomes of long standing it will contain but the streptococcus viridans. Dr. McDonagh said that if that were true Dr. Hunter would have to look further than he has done for an explanation of pernicious anaemia and many of the cases which had come under the speaker's personal notice would have to be explained anew, and the question was asked Dr. Gilmer if he had made investigations sufficiently extensive along this line to express an opinion.

Rosenow has proven that certain strains of streptococcus have affinity for certain tissues, and taking the work of Rosenow and combining it with the work of Hartzell, we see that the organisms which are confined at the apices of the roots are, or may be, responsible for certain specific kinds of systemic infection and that these organisms are not capable of producing certain other diseases which might be attributed to apical abscesses. By the use of this knowledge, a dentist who understands the subject might be able to say to the physician or patient, this disease can or can not be the result of alveolar abscess.

The paper touches upon another subject which is intensely interesting and of far-reaching consequence, viz., the transmutation of organisms in the oral cavity and the oral tissues. Dr. Goadby does not agree with Dr. Gilmer that the streptococcus is the only specific organism for rheumatoid arthritis.

In the matter of infection from suppurative perioclasia (pyorrhea) dentists have frequently marvelled at the small number of cases of general septicemia which result from such supposedly large areas of absorbing surface found in suppurative periodontal pockets, but, said Dr. McDonagh, the amount of absorbing surface is not nearly so large as it appears, on account of the covering of mucous membrane with which nature lines the pocket.

The speaker confessed to being a little bit puzzled by Dr. Gilmer's eulogy and condemnation of radiographs and could not agree with him in all he said regarding them. Experience teaches that radiographs will not always truthfully tell the extent of destruction of periodontal tissues nor of the pericemental membrane, nor was it always necessary to know how much of the pericemental membrane is destroyed. Notwithstanding Dr. Gilmer's statement that the pericemental membrane is a specialized tissue and will not rebuild, Dr. McDonagh said he could show slides and sections that plainly indicate that pericemental membrane will rebuild and that cementum will rebuild under it.

Attention was also directed to the fact that dentists, through faulty manipulation and inability or neglect to observe pathological conditions in the mouth, might cause in their patients loss of health or of even life itself, and reminded those present of Dr. Gilmer's question:—What are we going to do about it? Dr. McDonagh urged that every practitioner put the question to himself and honestly answer it.

DR. ARTHUR DAY, TORONTO:

Dr. Day, at the outset, stated that he was not going to discuss the paper from a scientific standpoint but from a practical viewpoint and referred to the paper as being so very complete that for an ordinary practitioner to re-state the facts would add little value to

the discussion. Dr. Day asked the questions:—In this subject of general systemic infection, where does the ordinary practitioner come in? What is he supposed to know about such diseases and what is he supposed to do about them? and proceeded to answer in the following words:—There are two cases wherein a knowledge of such disturbances may be of value: in the early stages of systemic infection, before the patient has consulted a physician, and in the later stage where the physician has diagnosed the disease and is hunting for the foci of infection. In the latter stage he sends the patient to the dentist to see if there is infection in the mouth, if the dentist finds it, he eradicates it, extracts, or treats the teeth or gums or whatever is necessary. If he finds no infection he reports that fact to the physician.

In the earlier stage of general infection, however, if a patient presents with an infected mouth we should look for symptoms of general infection. A muddy complexion, low fever, loss of weight and appetite, if there are muscular pains or digestive disturbances or constipation, the dentist is doing the patient a service in advising that they should see a physician.

If you think there is an absorption of pus into the blood stream it is your duty to insist that the patient go to a physician without delay and have a blood count made. When general treatment is commenced by the physician or in conjunction with the dentist, (and this is the practical part I wish to particularly speak about) the dentist should be warned against making any promises to the patient regarding a cure. Don't have the patient think that because a tooth be extracted they will be rid of their ailment. Rest assured that the physician makes no rash promises of a cure. Physicians have not been in the habit of guaranteeing their work, as some dentists have. We dentists have always been used to a positive diagnosis and an almost positive prognosis, but as we get into treatment of this character we must be more careful,—we are more uncertain. There may still be a focus somewhere else after the mouth has been cleared of infection. To give false promises or to have the patient disappointed in lack of improvement in the general condition after the mouth condition is cured, is only to give oral infection, as a cause of systemic infections, a set back, and to some extent justify its being called a "fad." There are many physicians who call it a fad, and some of the leading ones think that the extent to which it is being practiced is a fad. Among the latter is Dr. Caven of our own city.

As for the serum treatment, my advice is when it is started "get from under." Such treatment is only in the experimental stage. A vaccine is of no permanent value unless all the foci are removed, and if all the foci are removed then there is little need for vaccine. In studying this subject and in reading the vast amount of literature upon it we dentists will have to reason out the problems for our-

selves; specialists and research workers are very apt to become over enthusiastic.

To repeat the question, where does the dentist come in? Personally, I believe the dentist's chief work is along the line of prevention. He must recognize those incipient irritations which cause inflammations in the mouth. Once started, an infection with focus in some other part of the body may be continued by the smallest area of infection in the mouth, such for instance as a comparatively shallow gingivitis. Dental operations must be such that they will not cause gingivitis, or trouble at the apices of the roots. Otherwise dentistry will be blamed for many systemic infections, and justly so. Whether prophylaxis is necessary, or of value, certainly this may be said,—if there is a reasonable chance that it may remove the causes of mouth inflammation, it is well worth the time and energy it takes to perform. For in an infection of any kind, "an ounce of prevention is worth a pound of cure."

DR. A. E. WEBSTER, TORONTO:

Dr. Webster, in continuing the discussion, said that he wished to express pleasure in hearing Dr. Gilmer present this subject in such a sane manner. Most essayists on this subject are extremists either one way or the other. Dr. Webster remembered when a student at *Rush Medical College*, the late Professor Senn often remarked "patients who have a sudden rise in temperature should be carefully examined for some local point of infection." As a dentist it surprised the speaker beyond measure that upon no occasion did Professor Senn suggest a careful examination of the mouth for local foci of infection.

Dr. Black in discussing alveolar infections in his new book on pathology closes a chapter with this significant idea, "There are too many of my patients who are now dead, who were treated in a conservative way."

It is a common practice and the one advocated by Dr. Gilmer to treat chronic alveolar abscesses in which the apex of the root has lost some of the peridental membrane by amputation of the end of the root. Dr. Webster had never been able to understand why the root canal should be filled and then the amputation made, because the reason for the abscess in the first place was an infected root and the difficulty in sterilizing is great while ever the root end is infected. Dr. Webster declared it as his judgment that the root canal should be left open until after amputation, when it can be mechanically as well as chemically cleaned out and the root filling inserted, having the end of the root in sight, so that there may be no mistake about it.

Dr. Webster asked: What is the bacteriology of a chronic alveolar abscess which has burrowed a cavity sometimes as large as

a Brazilian nut? and remarked that in such cases there would seem to be little or no inflammatory reaction. No amount of washing through the root, out through the sinus, would bring about a cure in such cases. The speaker was especially glad to see so many cases of root filling extending through the root canals and an abscess still present, because we have been told recently that there is no harm in pressing foreign substances through the end of a root. Nature does not tolerate foreign substances in the alveolar tissues any better than in any other part of the body.

DR. F. ARNOLD CLARKSON, TORONTO:

It has been said that the medical profession considered oral sepsis as more or less of a fad. Unfortunately this is true, but not altogether in the way it was meant. Some of us are old enough to remember the blue-glass cure and Brown-Sequard's Elixir of Youth, which are now nothing more than an echo down the corridor of time. At present we are just getting through an epidemic of vaccines. Every kind of disease must be treated with dead bacteria and of course when the enthusiasm had worked itself out, we were bitterly disappointed. Perhaps the fault was in the vaccine, perhaps in ourselves. Now we have an epidemic of tooth-pulling. All diseases originate in the teeth, therefore extract the teeth. Montaigne, the French satirist, charged the doctors of his time with being Parents of a Bloody Moloch, but now his shaft could be more truthfully directed against the dentists, since medical men have practically ceased to bleed their patients. Dentists are certainly extracting a great many teeth, both healthy and diseased.

What is the relationship between the dentist and physician? Dr. Clarkson illustrated by a specific instance. A patient comes to a medical man who is filled with the idea that all the trouble originates in the teeth. The physician sends the patient to a dentist with orders to extract all teeth, healthy and diseased. Shall the dentist follow his orders? Shall he extract teeth which he knows to be healthy? In one case Dr. Clarkson knew of, three different dental surgeons refused to take out the teeth. On the other hand, he had under his care a man whose teeth were in excellent condition but who had sciatica. The physician considered the teeth the offending part, and the dentist extracted them. The result is that the patient is edentulous but still has sciatica. Other examples could be quoted too, that have been recorded at the *College Interspersary* and in other Clinics, that simply make one wonder where these things are going to stop.

Dr. Clarkson continuing, said, Dr. Gilmer referred to Dr. Rosenow, who is perhaps the greatest living bacteriologist in America, and who has done a great deal to apply his results to the lessening of the sum total of human suffering. He has found the streptococcus

in many different diseases. A patient may have an endocarditis and pyorrhea but it does not necessarily follow that one is the cause of the other. Yet one who doesn't understand Rosenow's work advises extraction. Good teeth and bad teeth have got to come out, as he understands the pathology of the dual condition, and the dentist becomes an accessory. This is what is actually occurring in this city, and in the end, these patients still have their local manifestations of the disease.

Dr. Clarkson's own personal opinion as to the ethics of this relationship between dentist and physician, is that the dentist should be treated like any other specialist-consultant. The dentist should give his report as to the conditions he finds, and the physician govern himself accordingly.

One reason that we have such ruthless sacrifice of healthy teeth is that the good old family dentist is passing away in the cities. The specialist is the rage just now and there are men who do nothing else but extraction. They have no opportunity to study the conditions fully, whereas the family dentist would have made an effort to save some, at least, of these teeth. In every case there must be a careful study of the case from every aspect.

Dr. Clarkson was glad that Dr. Gilmer cautioned against the extraction of too many teeth at one time and said he thought one of his patients had a recurrence of nephritis because of failure to observe this and said he would be more careful in the future.

REMARKS BY DR. GILMER IN CLOSING DISCUSSION.

I feel highly complimented by the kindly spirit shown me by those discussing my paper and I also wish to thank all of you for your generous hospitality during my sojourn in Toronto.

I did not come here with the thought of teaching you anything new on this important question, but that we might compare ideas in order to get each other's viewpoint and thereby obtain inspiration which will be helpful. Dr. McDonagh spoke of my reference to hemolyzing organisms in acute alveolar abscesses. In Dr. Moody's and my study of jaw abscesses we found the streptococcus hemolyticus in acute abscess and the streptococcus viridans the prevailing organisms in chronic abscess. In our first series, though not large, the findings were so universally constant that we believed that it represented what might confidently be expected if a much larger number of specimens were examined. Later studies have borne out this conclusion.

As Dr. McDonagh has said, Dr. Rosenow believes that certain strains of the streptococcus have affinity for certain tissues, while other strains have affinity for other tissues. If this is true, and we all have the greatest confidence in Dr. Rosenow's statements, then the organisms of apical abscesses, through changes brought about by

environment after escaping from the original focus, may be so changed that their selective nature may fit them in one instance to attack one tissue and in another, another tissue. If this is true the dentist cannot say to the physician or the patient that the organisms of an apical abscess are capable only of causing this or that disease.

What the paper said about radiographs ought not to be construed as a condemnation of them. What was meant was that they could not always be depended upon to reflect the true condition.

When patients are referred to the dentist by the physician, the dentist should assume the role of a consultant, examine the case and report the conditions found, with recommendations as to what should be done. In no case should the physician send a patient to the dentist demanding that certain operations be performed, any more than he would send a patient to an ophthalmologist with the demand to enucleate an eye. It is monstrous to think that physicians, as indicated by Dr. Clarkson, will order the extraction of good healthy teeth, or that dentists will become a party to such practice.

Dr. Webster does not approve of the recommendation in the paper that roots to be resected should first be disinfected and the canals filled. The method which he suggests may be followed, but that indicated in the paper seems preferable in the majority of cases. It is not desirable to retain dressings in the process wound sufficiently long to permit of thorough disinfection of the canal. When the root is cut off it is easy to see if the canal is filled. In case of weeping of a serous fluid into the canal from a carious area in the process, then the apical end of the canal should be filled at once, with disinfection following. When there is great destruction in the alveolar process at ends of roots it is due either to a cyst or caries of the bone, which is a suppuration osteitis. Cyst fluid, when the cyst walls have not broken down, is sterile. We have made no examination of the bacteria of carious cavities in the alveolar process. It has been thought by some that such cavities are due to the tubercle bacilli.

Dr. Clarkson recognizes the presence of fadists in medicine. They are also to be found in dentistry. In the forty years that I have been in dental practice there has never been a time when they were not in evidence. One must be discriminating in his conclusions regarding new theories. It is unsafe to accept everything offered, even though it appears plausible. On the other hand it is not wise to reject without consideration the findings resulting from careful work by good men. I well remember the time when some medical men of no mean ability, rejected the germ theory of disease.

Local Anesthesia with Use of Anocain.

B. R. GARDINER, D.D.S., TORONTO, DEMONSTRATOR IN EXTRACTION, ROYAL COLLEGE OF DENTAL SURGEONS.

FOR years members of the professions representing the healing art have been in search of a substitute for cocaine as a local anesthetic. In spite of the fact that the anesthesia produced by cocaine is perhaps ideal, it is undesirable because of its toxic effects.

At this point it might not be amiss to summarize the qualifications of a local anesthetic:

1. The drug must produce insensibility to pain in the desired area.
2. It must not be irritating to tissues when injected; must not produce any tissue lesions or after effects, such as pain or sloughing.
3. The solution to be injected should be isotonic with fluids of the tissues, i.e., should contain sufficient sodium chloride to make a normal saline solution.
4. It must be capable of being combined with adrenalin.
5. It should be capable of being sterilized by boiling.

Ever since the toxic effects of cocaine have been noticed, numerous substitutes have been introduced. Many have an advantage over cocaine inasmuch as they are less toxic, but usually the anesthesia produced is inferior. The more prominent of these, summarized by Dr. Herman Prinz, are as follows:

"Tropocain is less poisonous, but also less active than cocaine, it completely destroys the action of adrenalin; the eucains partially destroy the adrenalin action, they are, comparatively speaking, equally as poisonous as cocaine; acoin is irritating to the tissues and more poisonous than cocaine; nirvanin possesses little anesthetic value; alypin and stovaine are closely related, producing severe pain when injected, which occasionally has resulted in necrosis. Quinine and urea hydrochloride reacts strongly acid, and as a consequence severely damages the tissues in injected area. Novocain alone fully corresponds to all of the previous mentioned qualifications of a local anesthetic."

It is now impossible to obtain novocain in Canada, hence it has been necessary for us to look for an anesthetic which will be procurable at all times. True to the prophetic declarations of many, the war has already stimulated Canadians to prepare and manufacture articles for which we were at one time dependent on other countries. In the field of local anesthesia various substitutes have been compounded to take the place of cocaine. The one of most recent manufacture is anocain. It is a Canadian product, obtainable in tablet form, containing adrenalin and sufficient sodium chloride to give a solution that is isotonic with the fluids of the tissues when used in 2% solution.

THE IMPORTANCE OF AN ISOTONIC SOLUTION.

For the successful hypodermic administration of a local anesthetic certain physiological and physical laws should be taken into consideration. According to Boyle Van Hoff law two solutions of salt separated by a permeable animal membrane, will not remain so, but a current is set up which continues until the solutions are of equal density; they are then said to be isotonic with each other. It is by this process that plant cells are able to obtain moisture from the outside world, and this same phenomena is present in the interchange of fluids between the tissue cells of the body. If simple distilled water is injected into the tissues only superficial anesthesia is obtained, the tissues become macerated and death is the result. Solutions containing less than .09% of sodium chloride produce shrinkage. With a proper physiological solution absorption takes place more readily, the injection is accompanied by less pain and results in less injury to tissues.

THE ADDITION OF ADRENALIN.

Adrenalin, when injected into the tissues, temporarily raises the blood pressure by causing a constriction of the smooth muscle coat of the peripheral vessels. When adrenalin is added to the local anesthetic, the anesthetic action is greatly increased in injected area and the absorption of the drug is prevented. According to Eash, adrenalin has a specific action upon nerve tissue and prepares it to take up the anesthetic more readily. Adrenalin, combined with an anesthetic injection, increases the duration, giving a greater length of time to operate.

As stated above, anocaine is prepared in moulded tablets containing sufficient sodium chloride that when a tablet is dissolved in 1 c.c. of distilled water, a physiological solution is ready for use. This will give 2% solution.

ADMINISTRATION

No matter how good the anesthetic, perfect results cannot be obtained without its intelligent use. The infiltration of the tissues must be performed with care, as mechanical injury may occur, and oftentimes the blame has been laid to the anesthetic. The strictest asepsis must be maintained. If carelessness is permitted in any one part of the operation the result is a failure. It is like a great chain—one broken link and we know the result. A definite knowledge of the variations in the density of the bony process in different parts of the jaws, through which we wish the anesthetic solution to pass, and an accurate knowledge of the course of the nerves is beneficial in obtaining perfect anesthesia. It is impossible in the limits of this article to even discuss the last two factors mentioned. Detail is necessary and this may be obtained from a good descriptive anatomy. However, a few practical suggestions may be included in

to the care of the hypodermic, the preparation of the solution, the field of operation and the administration of the anesthetic.

STERILIZATION OF SYRINGE.

All metal syringes may be sterilized by boiling. Leather washers, of course, should be removed. After boiling, a very thin film of carbolated vaseline may be applied to the piston to facilitate an easy working action of the syringe. It is unnecessary to boil the syringe after each operation unless it has become contaminated by pus. To wash out repeatedly with alcohol and to dry thoroughly with hot air is sufficient. The writer favors the practice of keeping the point of the syringe submerged in a 25% aqueous solution of zycol. A bottle with a nickel top for this purpose may be had at a dental depot. When the syringe is removed from this, it should be rinsed in sterile water to remove any trace of zycol, as it is very irritating to the tissues. Zycol does not corrode the metal; on the contrary, because of its lubricant nature, it keeps the syringe in splendid condition.

PREPARATION OF SOLUTION.

A very practical and simple method of preparing solution is as follows: After determining quantity required place tablets in a sterile test tube, add to this the proper amount of distilled water, which has been previously measured out into a graduated minimum glass. The test tube is then held over a bunsen flame, the tablets become dissolved, and the solution thoroughly sterilized. The test tube during the boiling of the solution should be rotated slowly to heat it uniformly in order to prevent breaking. The solution is then poured into hypodermic syringe which, of course, has been previously sterilized and ready for use. The practice of pouring the sterilized solution from the test tube into the glass and from there into syringe should not be encouraged, as it is an unnecessary step and invites sepsis.

THE FIELD OF OPERATION.

It is not always possible to sterilize the field of operation, and especially is this true within the oral cavity. Authorities differ as to the detail in preparing the gum tissue before injection.

The area to be injected should be thoroughly dried and wiped off with H_2O_2 . It is then considered wise to paint areas to be punctured by needle point with a weak solution of Tincture of Iodine. It is not sufficient to merely wipe surface with this, but it should be massaged into the gums with a pledget of cotton to ensure of its penetration beneath the epidermis. Some operators use a solution of colorless iodine and alypin. The addition of alypin is certainly an advantage, in that it desensitizes the epidermis and the puncture of the needle is unaccompanied by pain, but the effectiveness of colorless iodine as a germicide is doubtful.

INFILTRATION

The kind of injection usually takes the name of the tissues into which it is injected. A number of terms have therefore come into use, such as "mucous anesthesia," "periosteal anesthesia," etc.; however, in injecting into gum tissue it is almost impossible to obtain mucous anesthesia without the solution penetrating the periosteum and alveolus, resulting in anesthesia of the three. The writer favors the term "infiltration." This, I believe, will not be as confusing, and more descriptive of the result. *For extraction* it is well to insert the needle into healthy gum tissue about midway between the gingivus and region of the apex of the roots. All air is expelled from the syringe, which is held in the right hand, with second and third fingers of the left hand the lips are held apart, and the point of syringe is gently guided into place by thumb. The orifice of the needle should always open toward the bony process. As the needle is gradually forced through tissues the fluid is expelled. The fluid may become encysted and a "bleb" formed. The needle should then be forced deeper or partially withdrawn, its direction changed, and embedded into tissues which will absorb the solution more readily. The periosteum is soon reached into which the needle may be inserted, and considerable of the fluid forced under pressure through process. The sense of touch should be developed to do this properly without breaking the needle. Should such an accident occur, the needle should be immediately removed. Where the absorption takes place slowly, and the pressure is constant, one may think that the aperture of the needle has become clogged, but a closer observation shows that the solution is slowly penetrating the alveolus. The fewer needle punctures, consistent with good anesthesia, the better. To do this the needle may be almost entirely withdrawn, the direction changed and again inserted. Occasionally a simple labial injection is sufficient for one upper incisor. If nerve trunks are near at hand it is advantageous to use combination of conductive and infiltration anesthesia. For example, one lingual injection into the posterior palatine canal will suffice for the lingual roots of first, second and third molars; for the buccal surface three separate injections may be made into the gum tissue, or one injection over the region of the tuberosity about one-half inch above the gingival line between the first and second molar teeth. For ordinary infiltration two injections over each tooth, one buccal or labial and one lingual, are sufficient.

Where a long needle is used, it may be inserted and continued over the region of several teeth. Where the process is thick and dense, as in the region of the lower molars, it is necessary to wait a greater length of time to obtain anesthesia. It is advisable to wait from eight to ten minutes in difficult cases in order to be certain of good anesthesia. This, of course, varies as to percentage of the

solution, and the rapidity of absorption. During this period agreeable conversation should be encouraged with patient to minimize fears of the coming operation.

For the removal of pulps it is necessary to inject as close as possible to apex. Anocain has proven very efficacious for the removal of pulps, and also as an obtundant in preparing sensitive cavities. It is always desirable to use a 2% solution for this purpose. For extraction I have used in all cases a 1% solution. In so doing I have had to add twice the amount of water that is used for a 2% solution. It was then necessary to add additional sodium chloride to re-establish the normal saline solution. When the manufacturers learn that we have clinically proven the efficiency of a 1% solution, a tablet no doubt will soon be ready for that purpose, and eliminate the necessity of adding more sodium chloride as mentioned above.

Submitting anocain to the test for qualities previously mentioned for a local anesthetic, I would say that it measures up to the standard to a very high degree. It is not irritating when injected into tissues; splendid anesthesia is produced; and in over one hundred cases in which I superintended its administration for extraction, each case being carefully recorded, as nearly as I was able to ascertain no after soreness nor tissue lesions have resulted. In only four cases had I any symptoms whatever. In two cases these were not of a serious nature, and were chiefly due to fear and nervousness. In the other two cases the drug certainly produced systemic disturbances.

The four cases were as follows:

Case A.—Mrs. J., age 42, 150 minimums of 1% solution were injected; patient complained of nausea, but soon recovered after having been taken into the rest-room and allowed to recline on the couch for a short time. It is quite possible in this case that the operator who injected the solution allowed a little to escape into the mouth and the patient swallowed a small amount. The inconvenience caused in this case was so slight that it was scarcely worth recording, yet it is sufficient to show that the very closest observance was given to each patient and each case recorded.

Case B.—Mr. P., age 42, patient of a very nervous temperament and undoubtedly susceptible. A small amount, 30 minimums, of a 1% solution, was injected to remove a single tooth. Pulse became more rapid and patient lapsed into a slight narcotic slumber, meanwhile perspiring slightly. For a moment he might have been unconscious, but soon he was able to keep up conversation. A few minutes later he gave a slight start as if he had been asleep, and he expressed his pleasure at having had a "beautiful dream."

Case C.—This is a case where local anesthesia undoubtedly was contra indicated. This woman had a leaking valve of the heart, and the strictest care was taken of her at home. She avoided any excessive exercise, and never was left alone. Family physician refused

to give her a general anesthetic. It was necessary to remove five roots. About 20 minimums of a 1% solution were injected. Immediately patient complained of dizziness and threatened to collapse. Smelling salts were given her, a dram of aromatic spirits of ammonia in half a glass of water were given her to drink. She felt much better, and the administration and extraction of three teeth were then completed without any further inconvenience. The next day she returned and novocain was used for the other two roots. She felt the same systemic disturbances, but not so marked. On returning home on this occasion, however, she was confined to her bed for a few days.

Case D.—This was an elderly woman, somewhat inclined to be melancholy, who became especially so after injecting solution. She began to tremble and weep, apologizing in the meantime for her actions. She could not understand it; she felt no pain, but kept excusing herself, and said that she had been bereaved a few months previously in the death of her husband.

Impressions of the Twenty-third Annual Meeting of American Institute of Dental Teachers.

THOMAS COWLING, D.D.S., TORONTO.

A NATION'S literature indicates with great accuracy the nation's ideals and aspirations. As with a nation, so with lesser communities and organizations. If one were given the task of selecting from the mass of dental journals, papers, etc., published throughout the entire world, the essays that embody the best thought in modern dentistry, one would instinctively turn to the journals published by the dental profession of the United States of America.

That American dental literature holds the premier position is due to the fact that dentistry in the United States, by reason of the devotion and skill of its leaders, has far surpassed that of any other and of all other countries. The task of following and perhaps obtaining a place alongside the leader is, indeed, a very difficult one.

Take up any of the representative American dental journals, and in them you will find a mass of carefully selected information that is of inestimable value to the dental and, we may say, the medical profession as well. Conditions have changed so within recent years that dentists are now inviting the medical fraternity to learn something of dental problems. In reviewing these publications one is amazed at the wide range of subjects selected for discussion by the various contributors—men with special training in their department.

men capable of great accuracy and detail, both in experimentation and observation. Indeed, the impression is forced upon one that these men are truly masters in their particular fields of activity.

Within the past month the twenty-third annual meeting of the American Institute of Dental Teachers was held at Minneapolis. Many of the editors of and contributors to the American dental journals were present at this convention. Some of them took part in the deliberations of this body, so it was possible to get a near view of "the big guns in action" and supplement or correct views already established through more or less intimacy with their publications. It is true, unfortunately so, that an author oftentimes holds our admiration by reason of the many excellencies of his writings, yet falls miserably short of our expectations when brought into more or less intimate touch with us in committee deliberations or platform work. This was not true of those who took part in the sessions of the convention at Minneapolis. One could not help being thrilled when listening to the addresses delivered by these the leaders of the profession. The technically trained mind, the cultured mind, the scientific mind—all were represented. That dentistry, under the leadership of men of such mental and moral fibre, will, ere long, take a recognized place well up with the best of the learned professions—this is the fact that was thrust home upon all who had the privilege of listening to these speakers.

The purpose of the convention was to arrange a four years' course of study for dental students. It might be stated in explanation that next year all recognized dental colleges in the United States will give a four years' course. Now many require a student to be in attendance only three years. Committees prepared reports on the various subjects of the proposed new curriculum. These reports dealt with the correlation of subjects, methods of presentation, approximate time allotted to each, etc. The impossibility of arranging one curriculum for all colleges was early made apparent. Many dental colleges are situated near the parent university, and are thus able to arrange for the teaching of scientific subjects in the University proper. Other schools may be departments of a university located at a distance, and so are deprived of teaching advantages from that source. Then, again, one school may be richly endowed, either by individuals or the State, while others may perforce have to be self-sustaining. The problem of arranging a curriculum, therefore, was recognized as being local or individual in character.

One difficulty, and this seemed to be common with all schools, was the admission of students whose preparatory education did not include studies in scientific subjects, such as physics and chemistry. If these students find their way to the schools of dentistry, under present conditions, they are placed on the same basis in the first year as those who have already received training in these subjects.

Obviously, this is unfair. The consensus of opinion was that dental colleges ought not to take upon themselves work properly belonging to the preparatory schools. It was thought possible to approach the high school authorities with the view of having them make these subjects compulsory for all students, whether or not they contemplated a professional career. In the dental department of the University of the State of Minnesota it is now a rule to refuse full admission to a student who has not received training in chemistry and physics. If a student applies and has not had preparation in these subjects, he is referred to these departments for instruction, and having completed his studies in these branches he is then allowed into the first year class. In effect, then, he is kept out for one year. The advantage of such a method is that all students of the first year are on the same basis as regards preliminary training, and the class proceeds, as a whole, with the regular curriculum of studies.

Where the dental college is a department of a neighboring university, a curriculum is sometimes arranged so that such subjects as physics, chemistry, biology, technical drawing, English, histology, bacteriology and metallurgy are given in the first and second years. Credits are allowed for all, or nearly all, of these subjects in the general university courses, so that if a student is deemed, at the end of the first or second years, unsuited for dentistry, he may be referred to some other course in the university, and will not have suffered serious loss of time through attendance in the department of dentistry.

In practically all of the dental colleges visited by the Toronto delegates it was found that the heads of departments, or nearly all, were full time men. That is to say, the teachers spent all their time in the school and did not attempt to carry on private practice as well. In such an arrangement there is an undoubted advantage. More time can be given to the students, especially those who are backward with their studies. On the other hand there is danger of a teacher, who is out of touch with actual conditions of practice, getting away from the absolute essentials in dentistry.

Many dental colleges have allied themselves closely with the medical departments of the university. By this we mean that for the first two years the students in dentistry and medicine take practically the same work. It is claimed for this system that a more complete understanding between dentists and physicians is brought about because each sees the viewpoint of the other. At McGill University, Montreal, such an arrangement obtains, and no doubt upon the introduction of the four-year course in the United States some such plan will be adopted in most colleges. Many dental authorities are opposed to any such affiliation because, as they claim, the dental student does not get that particular care his work demands. Dentistry in Great Britain is handicapped, so it is claimed, by reason of its being conducted under just such conditions.

In an editorial appearing in *The Journal of the Allied Dental Societies*, December, 1915, issue, the relation of dentistry to medicine and the adoption of the four-year course is commented upon in part as follows: "The dental specialty has taken its natural place as an essential part of general medicine, and not only our medical faculties, but our public men of financial power are aiding in bringing about the founding of suitable institutions of learning, whereby the dental graduate in times to come will be equipped adequately to care for the human body from his special viewpoint—modern dentistry demands varied and positive capabilities. The practitioner should have the maximum of general medicinal knowledge, consistent with the special training necessary to make him a competent dentist. The dentist, while he *should* be a good physician, *must* have these added qualifications (i.e., digital skill, etc.), in order to practise his specialty. Therefore the question presses: What constitutes a curriculum which shall meet these varied needs within the four years prescribed for the regular medicinal course?

It may be stated at once that the preliminary requirements should be those demanded of the medical matriculate, and that in total working time and academic credit the dental course should be the equivalent of the medical, as prescribed in our leading universities. The first two years would naturally be nearly parallel in the two courses, but some divergence will exist from the beginning. *The dental student should know from the first that he is to be a dentist.*

Among some of the striking innovations in the specimen curricula submitted to the convention was the inclusion of English as a first year subject in dentistry. This subject embraces description, narration, exposition and argumentation. Time is allotted this subject throughout the entire first year. It was pointed out, by way of explanation, that in the United States the standard of admission into colleges was a varied one, it being possible to obtain entrance with only a very poor knowledge of the English language. Manifestly it increased the difficulty from the teacher's standpoint. How could a student receive instruction which was given in English, if such student did not understand English? For Canadian dental colleges this difficulty is not so marked. Mechanical drawing becomes a subject of the first year, so that students may become proficient in illustrating simple dental appliances, etc. Afterwards, when as a practising dentist, he is called upon to write an article for publication, he is able to make suitable illustration, and so amplify his work.

One of the outstanding features of the convention was the fact that unanimously the delegates agreed that the extra time secured by reason of extending the course one year, should be devoted to further consideration of subjects such as physics, chemistry, bacteriology, pathology, physiology, etc. Practically no added time was granted to purely operative departments. It was deemed advisable to urge

the high schools to relieve the college of such subjects as English—or the cultural subjects, and leave to the dental college the duty of emphasizing the scientific subjects. This might mean the exacting of a higher standard from the high schools, but it would be worth while. The inauguration of the four-year course in all colleges in America marks the turn of the tide. The future of dentistry is assured! Look at the adjustment of the new curriculum of studies! Observe the extra amount of time allotted to the study of bacteriology, physiology, chemistry and allied scientific subjects. In some cases the amount of time given under the old three-year course for operative and prosthetic technique has actually been curtailed under the estimated four-year course. Interpret this in any light whatsoever and the only conclusion to be arrived at is that the mechanical dentist of yesterday has to give place to the scientific dentist of tomorrow. "Prevention instead of cure"—this is the new motto for dentists.

Address Delivered to Toronto Dentists by Major Clayton, Acting Chief Dental Officer, Canadian Army Dental Corps.

ON Saturday afternoon, January 29, 1916, the dentists of Toronto gathered in the Assembly Hall of the Dental College, Toronto, upon the invitation of Captain W. G. Trelford, C.A.D.C., O.C., No. 2 Division, to meet and hear Major Clayton, who recently returned from six months' overseas service.

Dr. R. Gordon McLean made an ideal chairman and the college orchestra was much appreciated by those present.

Major Clayton paid tribute to the sterling qualities of the Canadian soldiers at the front, saying that no matter to what branch of the service they belonged, they could not be put in that class called cowards. Canadians were made of the fabric that sees a thing through to the end. Major Clayton expressed the opinion that possibly the C.A.D.C. had made mistakes, just as every branch of the service and every nation had made mistakes, and yet considering the short time of its existence it had accomplished wonderful good. Dental clinics have been established and are in operation from Vancouver to Halifax, to Greece and back to England again, covering as well services to Canadian troops in France and Belgium.

A passing tribute was paid to the many dental societies in Canada for the preparatory work that was accomplished prior to the founding of the Dental Corps. A very graphic account was given of the establishment of dental clinics overseas. These are in operation at Shorncliffe, where there are six chairs, and a central dental laboratory.

tory at St. Martin's Plain, manned by upwards of twenty men. Forty to fifty dentures are finished per day, and the dental corps is at times overwhelmed by the hundreds of patients presenting themselves each day. The same conditions prevail at a clinic established at Havre, France. The dental surgeons work hard and find their reward in the gratitude of the Canadian soldiers, who sincerely appreciate the attention they receive.

Similar clinics are in operation on Sir John Moore's plain, Napier, Risborough, Ross and Somerset barracks, and all are overwhelmed with work. In France the dental members of the Canadian Army Medical Corps were absorbed by the dental unit, but the work in this section has been entirely inadequate, as the C.A.M.C. deemed it unnecessary to have more than one dental surgeon attached to each field ambulance. This has necessitated the invaliding of many soldiers back to the various bases, with consequent heavy loss of time, to have their dental work attended to. Vast numbers of soldiers have, during the progress of the war, been incapacitated through dental conditions, and this of course represents tremendous economic loss.

In the absorption of the A.M.C. dentists by the C.A.D.C. an important gain to the A.M.C. officers is effected, in that they at once received substantive rank where before only honorary rank had been received (for, in some cases, as much as nine years' service). The formation of the C.A.D.C. was responsible for dental officers receiving substantive rank, whose services, however much needed and appreciated, only received honorary recognition under the old regime.

Major Clayton asked why the Dental Corps should not have complete access to the Red Cross stores, and made a strong appeal for the loyal and active support of the entire dental profession.

The speaker proved himself an entertaining and forceful speaker, and was most eloquent in his vivid description of his trip across and the dangers encountered in the "submarine zone." Major Clayton's address was an inspiration to those present, and awakened a new and more intelligent interest in the affairs of the Canadian Army Dental Corps.

TRIBUTE TO SIR SAM HUGHES.

During the progress of the meeting both Major Clayton and the chairman paid tribute to the Honorable the Minister of Militia and Defence, Major-General Sam Hughes, K.C.B., for his services in connection with the organization of the Canadian Army Dental Corps. Sir Sam Hughes is the one to whom credit belongs for the organization of the corps, and continues to take the keenest interest in its welfare and continued development. The dental profession in Canada owe much to Sir Sam for placing the dental services in the militia upon a basis which will make for the greatest efficiency.

Captain Trelford gave an interesting report of the dental work

accomplished at Exhibition Camp, Toronto, and paid tribute to the high efficiency of the clinic, which had been under the direction of Captain Hume until the time of his transfer to Salonika.

Dr. Wallace Secombe gave a report of the Canadian Army Dental Fund and the meeting adjourned following a hearty rendering of the National Anthem.

Great Need for Reading Matter at the Front.

EVERY DENTIST MAY HELP.

CAPTAIN CHAS. A. CORRIGAN, Dental Surgeon, who went to the front with the first Canadian Contingent, attached to the Army Service Corps, and now stationed in Flanders, has written members of the dental profession suggesting the pressing need for reading matter in the trenches. Magazines, such as are usually found in a dental reception room, or in fact any of the regular monthlies, are appreciated by the soldiers. In many cases, "something to read" is more in demand than "smokes," and is frequently less available.

Many Canadians at home regret they are unable to be of greater service in the struggle, but who is there but can remember to send over a package of magazines each month? This is a small request, but its fulfilment is most important. Reading matter is essential to the comfort of the soldier, and is quite necessary if he is to maintain his health and general efficiency.

Send a package off now and make an entry in your appointment book each month that the matter may not escape your attention in the future. Dr. Corrigan's work is of such a character as to enable him to not only appreciate the demand, but make it possible to see that the magazines you send find their way to the place where they are most needed.

Address:

CAPTAIN CHAS. A. CORRIGAN,
No. 3 Company,
Divisional Train,
First Canadian Division,
Canadian Expeditionary Force,
France

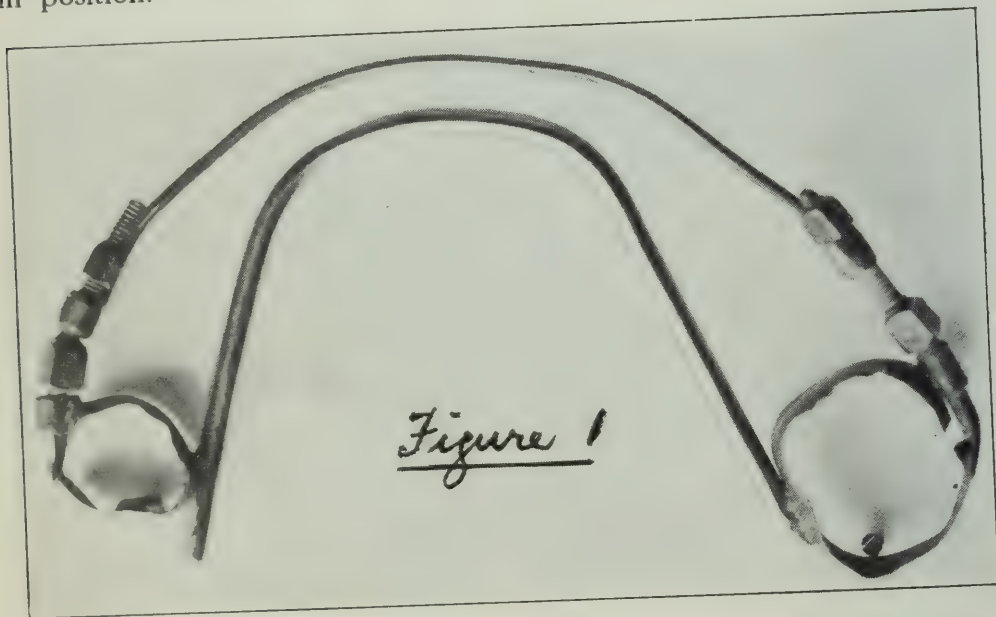
The parcel-post rate of postage prevails for magazines and periodicals sent direct from Canada to France, namely, 7 pounds for 32 cents. In mailing, the postmaster will affix a declaration, to be made by the sender, that the parcel contains magazines only.

Splint for Fractured Mandible.*

WILLIAM HERNDON PEARSON, D.D.S., NORFOLK, VA.

NOTHING original is claimed in this appliance, but I have never seen one like it; it is very simple in construction and application.

A proper plaster impression of the mouth is absolutely necessary. Saw model of the mandible where the break is, and place parts together in their proper occlusion and fix same. In this case here exhibited, fracture is between left cuspid and lateral; the left six-year molar is so badly broken down that it would not support the band, hence the next best tooth was chosen, which is the second bicuspid. A screw band was constructed to fit same, having the threaded portion to the buccal side of tooth; make the same kind of band for the first molar of the opposite side, placing the threaded portion to the buccal side. After these are placed in position on the model take a piece of gold platinum wire, 14 gauge, and fit same carefully to the lingual surface of the teeth just at margin of gums, having wire touch each tooth. This is then soldered to the bands in position.

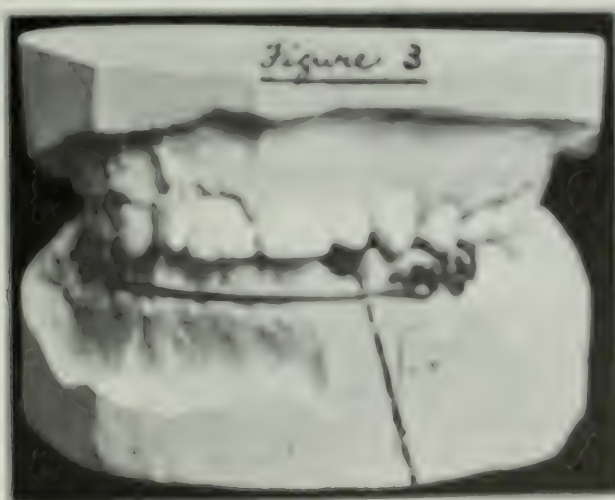


Now take two small pieces of tube and fit to the threaded position of band on the buccal side, having tubes so that they will slip freely. Take piece of 20 gauge wire of material that the temper can be removed (gold wire could be used), bend as shown in Fig. 3, then fit to labial surface of teeth and solder to tube at each end, having it so adjusted that the tubes will slip in their respective places and allow the nuts to catch. Having the lingual arch and bands on the

*Table Clinic, Virginia State Dental Society, Richmond, Va., November, 1915.



model, place the labial arch on to see that it is in right position. Now we are ready to install appliance on patient. Remove the labial arch and place the lingual arch in position, working one hand in place at a time and tightening same. When these bands are in position and nuts tightened the jaws will be forced in their proper position with a little help of your fingers at the broken parts. Having the jaws properly occluded, slip the labial arch on and tighten screws; this will hold the jaws absolutely rigid.



To overcome any possible change in the two portions of jaw use small wire ligature (about No. 28 to 30), running same between teeth from one arch to the other, and when necessary ligature can be put around any individual tooth when deemed advisable to reinforce anchorage.

This appliance is also applicable to fractured maxilla, and there is one great advantage in this splint—it does away with the necessity of wearing a bandage.

Chicago Dental Society's Fifty-second Annual Meeting.

W. B. AMY, D.D.S., TORONTO.

ON January the twenty-eighth and twenty-ninth, the Chicago Dental Society held its annual clinic at the La Salle Hotel.

The chronicling of this event may not, at first glance, appear to be of any interest to the Ontario dentist, as the great majority of them apparently do not recognize the importance of just such gatherings. But those who know spare neither time nor expense to be on hand when the Chicago Dental Society holds its annual meeting.

The importance of these dental conventions consists not only in the knowledge we obtain professionally, but in the broader outlook we get on life, through intercourse with men who have seen visions we have not seen, and who have accomplished great things for humanity. Thus benefited, we return home with a fresh grip on ourselves, a stronger belief in the needs of our profession, and better citizens in every sense of the term.

The Chicago Dental Society, generous in all of its undertakings, uses the greater part of two floors of the La Salle Hotel for its meetings. The exhibitors occupy one very large room and numerous smaller ones for their varied displays. The clinics are given in the large banquetting hall of the hotel, with overflow clinics in some of the nearby rooms.

The first day was wholly given over to surgical clinics of different kinds. Dr. Thos. L. Gilmer gave a surgical clinic at the North Western University Dental School, removing cysts, etc.; Dr. T. W. Brophy a "Cleft Palate Clinic" at St. Joseph's Hospital; Dr. W. H. G. Logan, a surgical clinic and special demonstration of conductive anaesthesia with novocain, at the Willard Hospital.

Dr. Roy G. Pearce gave a special clinic demonstrating the effect of nitrous oxide anaesthesia, asphyxia, hemorrhage, pain, and shock on the circulation, at the University of Illinois, and Dr. Louis Schultz followed Dr. Pearce at the same college, with a clinic showing the technique and application of novocain in dental and surgical procedures.

In the evening seven or eight hundred dentists gathered in the banquetting hall of the La Salle Hotel to listen to Dr. Edward C. Kirk give an exceedingly scholarly and interesting paper on "The Problem of Dental Education in the Light of Public Demand."

Saturday, the twenty-ninth, was wholly taken up with table clinics, of which there were about seventy-two.

We could not help but admire the thoroughness with which all the details had been worked out, and the enthusiasm evinced by those in charge. Nothing seems too great a sacrifice for these men to make, and it is to men such as these that dentistry owes a debt that only posterity can pay.

THE COMPENDIUM

This Department is Edited by
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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

PYORRHEA ALVEOLARIS

A RESUME of our knowledge of this baffling dental lesion forces one to the conclusion that, in spite of the fact that it is occupying the thought and attention of more research workers than any other branch of dental pathology, yet we have progressed but little in essentials. A brief synopsis of the accepted facts relating to the disease would appear to be as follows:

Pathology.—Talbot and Noyes describe the pathology of the disease as a traumatism of the circular ligament resulting in a progressive chronic periodontitis combined with destruction of the osseous alveolus. The soft tissue is altered into granulating tissue with more or less pus formation. Systemically, a certain predisposition seems to be necessary for the development of the disease, and in most cases local deposits of calculus present with loosening of the normal attachment of the gums to the teeth.

Etiology.—In our present state of knowledge, the etiology would appear to be somewhat complex, since we cannot point definitely to any one definite causative agent. Tartar formation, bacteria, malocclusion, trismus, nervous grinding of the teeth, trauma appear to be the commoner local causes, whilst *nutritional disturbances*, common to chronic rheumatism, diabetes, auto-intoxication, chlorosis, anaemia, pregnancy, etc.; *infections*, such as tuberculosis, pneumonia, pericarditis, syphilis; *toxic medicinal agents*, such as mercury, lead, iodine, etc.; these seem to bring about a condition of reduced resistance that would systemically predispose to pyorrhea.

Symptoms.—1, Looseness of teeth; 2, redness, swelling and loosening, or shrinking of the gingival; 3, secretions; 4, formation of pockets and granulations; 5, dull sound on percussion; 6, elongation and movability of teeth; 7, deposition of tartar; 8, formation of fistula with fetid breath from discharge; 9, swelling of lymphatic glands; 10, gradual advance of the disease and tendency to recurrence.

Therapy.—Local removal of all calculus deposits and polishing of the root surfaces is an absolute essential to any form of medicinal treatment. This may be accomplished by mechanical means, the operator using the form of scaler which in his hands has given best clinical results, and he may augment this by the use of some of the chemical agents at his disposal, such as formic, aromatic sulphuric, trichloroacetic, hydrochloric, lactic or nitric acids; or ammonium fluorid to decalcify the tartar and assist the work of instrumentation. Masticatory stress must be made uniform, splints applied to very loose teeth, and those teeth removed where the prognosis is unfavorable. The pockets should be cleansed with H₂ O₂ or hot glycothymoline; preparations of iodine, chlorophenol, or zinc chloride may be applied to reduce the inflammation, and these are assisted by digital or vibratory massage and the use of the high frequency current. The systemic treatment would appear to indicate close attention to the alimentary functions, the cleansing of the intestinal tract by the use of salines, etc. Deep muscular injections of 4-5 gr. of succinimid of mercury, as suggested by Dr. B. L. Wright, have given wonderful results. When, upon the examination of pus from the pockets, endamoebae buccalis are found to be present, hypodermic injections of emetine hydro chloride may be of assistance. The use of vaccines for combatting the micro organisms is questionable, and to quote Dr. Riethmuller: "He who wishes to treat pyorrhea successfully had better become a skillful, deft operator first instead of pinning his faith to the hypodermic syringe."

RAPID TREATMENT OF PYORRHEA AND OF SENSITIVE CAVITIES BY ELECTRICITY.

In the *Commonwealth Dental Review*, December, 1915, Dr. R. Morse Withycombe takes up the question of Cataphoresis as applied to dentistry. The failure of this method in desensitizing cavities is due to the fact that the electrode must be held in the cavity for about fifteen minutes, a procedure which is "a sore trial to the operator and most unpleasant for the patient." A second cause of failure is, in the author's opinion, the practise of using too small an electrode. In the method of treatment outlined by Dr. Withycombe, a rheostat is used and is particularly described as follows: "Prepare a piece of tough wood, nine inches long by one-eighth of an inch in diameter, sand-paper to a smooth round surface; allow this wooden rod to stand; when not in use, in a test tube containing a small quantity of glycerine and salt. Procure a solid carbon cylinder about one inch in diameter, and saw off two pieces each an inch long. Now bore a hole horizontally in both to permit of the easy passage of the wooden rod through. Next bore transverse holes in each for the purpose of receiving the two terminals of broken circuit. Make a plaster of Paris stand with two supporting arms for the wooden rod to be suspended between, which may be suitably enamelled. We

now have the wooden rod saturated at one end, two carbons, and a plaster stand, which combined make an excellent rheostat. When about to operate, I remove the wooden rod from the test tube and pass it through both carbons and suspend the whole on its stand, and, placing the terminals of broken circuit in transverse holes, slide one carbon to one end of the rod and the other to the other; the one on the dry end is the one to be adjusted, the current being increased with its passage along the rod. In this way there is no sudden shock as with a cell collector, and no metal or screws being used, we reduce to a minimum the chance of an accidental breakage of the circuit, or clogging with verdigris." When treating several teeth simultaneously by this method a bunch of fine insulated wires branching from a main supply wire is used. A desensitizing paste is prepared by mixing fresh cocaine with a drop of normal saline solution. This paste is incorporated into a ball, formed by rolling together a piece of gauze composed of very fine wire and silk. This wire and silk gauze enclosing the cocaine paste is cut into pellets and placed in the cavity to be desensitized. A wire terminal is connected to the pellet and the cavity sealed up with a preparation of gutta-percha and wax. The wire gauze is used because of the innumerable edges of terminals from which the current may pour. "The indifferent or negative electrode is now placed in position and the current switched on to a strictly comfortable amount, the most sensitive cavity becoming the index or least common denominator of the whole. The current is agreeably raised during the administration until at length all sensation of it to the patient disappears."

In treating pyorrhea, the author considers that two forms of electricity at least are necessary, namely, Galvanism and Faradism; the first used for ionisation—an effectual means of destroying pyogenic micro-organisms; the latter being used to stimulate nerve action. The technique in this case is described by the author. "I cut tin-foil into a number of strips, such as we prepare in gold-banded crown work, and have sewn around them a thin layer of cottonoid, after which they are perforated freely with a needle, my object being to surround every neck and root with a combined perforated metal and cottonoid collar, which may be saturated with a zinc solution. I pass them well down into the pockets and then secure them in position with a clamp. I then link up the clamps with wire and protect the area to be treated from saliva with cotton rolls. I now place a band of combined tin-foil and cottonoid, which is saturated in normal saline solution, around the gums, wedging it between them and the cotton rolls. Then connect this continuous band with the faradic current, adjust the indifferent electrodes, and we are now prepared to give two forms of treatment simultaneously: ionisation and faradisation."

COBALT AS A SUBSTITUTE FOR ARSENIC IN DEVITALIZATION OF THE PULP.

An original communication by an unknown author appears in the *British Journal of Dental Science*, January, 1916. Recognizing the danger of necrosis, etc., attending the use of arsenic in the tooth pulp, the author suggests the substitution of a salt of cobalt. This salt is mixed with oil of cloves and used precisely as arsenic is used. "This agent, if applied properly, usually takes two days to act, but its application is, as a rule, unattended by the two hours of pain which is always to be anticipated in the case of arsenic." The author admits that the action of cobalt may possibly be due to the presence in the salt of minute quantities of arsenic. In further commendation of this salt as a devitalizing agent the author says: "This cobalt dressing can be left in the tooth without any danger of it travelling through the apices, and this is so even in the case of children; however, it is inadvisable to leave the cobalt in for longer than a week." In view of the above advantages the use of cobalt is suggested in those cases where there is a probability of the patient not returning for treatment at the proper time. If arsenic were left in the tooth a condition of soreness, etc., would obtain, making further operative methods very difficult. Cobalt would be indicated under such conditions. Another great advantage of cobalt over arsenic is when an exposure of the pulp is obtained. "Should a cavity be very sensitive, a little novocain swabbed round will probably enable the operator to obtain the exposure, and should there not be time to permit the completion of the operation, then cobalt may be applied. When this procedure is adopted, the pulp at the second appointment should be dead, and it is quite exceptional for a second application of the cobalt to be made. A bristle placed in the canal in the ordinary way will remove the pulp in one piece—in fact, it is difficult to say if there is any greater lack of facility in removing it either under the influence of cocaine or of a cobalt dressing. Should the cobalt not have taken effect as desired, cocaine may be then used quite satisfactorily, but after the use of arsenic cocaine proves to be of no value."

CASES OF OCCUPATIONAL INFLUENCES UPON THE TEETH.

A very interesting account of observations of occupational influence upon the teeth is given by Christopher C. Beling, M.D., Newark, N.J., in the December, 1915, issue of *Dental Cosmos*. He finds that "workers exposed to the effects of mercury and arsenic are more prone to suffer from putrefactions of the gums, which induce pyorrhea and oral sepsis." Regarding the effects of copper, he instances a case of a man fifty-eight years of age, who had been a worker in copper for twenty-nine years. "He was suffering from mental depression and neurasthenic symptoms. There was a heavy lustrous deposit of a greenish brown color on his teeth, but no evi-

dence of sepsis, caries, or recession of the gums. He had never taken any care of his teeth. In his case it is reasonable to conclude that the copper salts had a prophylactic influence against the occurrence of caries and oral sepsis. This also emphasizes the fact, well recognized by the dental profession, that copper amalgam has a beneficial and preservative action in the prevention of dental caries."

Turning to the effects of mercury, a striking contrast is made. The author speaks of a strong, well built man, forty-nine years of age, who, having worked as a hatter for twenty-two years, had long been exposed to the influence of mercury. "He had always been well, except for occasional gastro-intestinal disturbances. During the past four or five months he had complained of pain in his joints and neuralgic pains diffused all over his body. For about two months the right shoulder was quite painful and stiff. On the day of examination he complained of severe, paroxysmal pain in the head, so intense that he thought he would lose his mind. His skin was cold, pale, and bathed in a profuse perspiration. The tongue was heavily coated, the flow of saliva increased, the gums were swollen, tender, covered with pus and bleeding readily. Pyorrhea was marked, caries slight."

ROOT CANAL FILLING—TWO METHODS.

Dr. H. C. Werts, in *Dental Summary*, January, 1916, gives a brief outline of two methods for filling root canals.

"*First Method*, Dr. Callahan's method: Dissolve 12 gr. resin (violin bow) in two drams of chloroform. This preparation is carried to the orifice of the canal with the dressing pliers, and pumped to the apex, followed by gutta-percha points to fill the canal.

"*Second Method*, by Dr. Buckley. It has been found that air cannot be displaced by a solid or a semi-solid. It is therefore necessary to displace the air in a root canal with a liquid, using a square broach to pump the liquid to the apex, as a round tapering broach entering a canal of the same shape acts as a valve, preventing the air from escaping. The square broach comes in contact with the canal along its four angles, letting the air escape and the liquid takes its place. Eucalyptol compound is the liquid. This liquid is displaced by eucapercha compound, a semi-solid, followed by gutta-percha points."



MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

VARNISH FOR SILICATE CEMENT FILLINGS.—A good varnish for protecting silicate cement fillings against moisture may be made by dissolving sticky wax in ether.—*R. S. Boys, Commonwealth Dental Review.*

TO COMPENSATE FOR SHRINKAGE IN A LARGE GOLD INLAY.—Where a cast gold inlay is to be made for a cavity involving the mesial, occlusal and distal surfaces of a bicuspid or molar, if there is any shrinkage the inlay will invariably show a defective line at the gingival margins. To overcome this, the gingival margins of the cavity should be quite freely beveled so that the inlay will cover them with a lap joint instead of a butt joint. Even if there is a slight shrinkage, the thin lap of gold can be burnished down to the cavity margin, so that when cemented the inlay will perfectly seal the cavity.—*Dental Review.*

OBTAINING CORRECT BITE.—It is often difficult to persuade a patient who persistently pushes his lower jaw forward to bite in something approaching the proper position. We have all heard and tried many tips concerning this, but if others fail, the following procedure will often be successful. Ask the patient to sit up in the chair well away from the head-rest, to throw his head back as far as possible, looking up to the ceiling, and to close his mouth in the most comfortable position he can. If he thrusts his mandible forward now, it will only be by a determined effort to do so.—*E. Holman, British Dental Journal.*

FINISHING SYNTHETIC PORCELAIN FILLINGS.—The instruments used in reducing the size of a synthetic porcelain filling should be the same as those used for reducing the bulk of a gold filling. The manufacturers advise not to use any steel instruments in the finishing of these fillings. They only suffer from a nightmare, as we have either inserted or supervised the insertion of hundreds, perhaps thousands, of these fillings, and have yet to see the first synthetic porcelain dis-color when care was used during the mixing process.—*C. Davis, Western Dental Journal.*

SEALING MEDICAMENTS IN TEETH.—A pledget of cotton rolled in thick chloro-percha is superior to cotton and sandarac for sealing medicaments in cavities.—*Dental Digest*.

BURNS FROM ACIDS.—If you get carbolic acid on any surface where it is not wanted, apply absolute alcohol at once. If hydrofluoric acid, apply a strong solution of bicarbonate of soda. Never use these acids without having readily at hand some agent to stop their action immediately in case of accident.—*Dental Review*.

XYLOL FOR DISSOLVING GUTTA-PERCHA CONES FROM IMPERFECTLY FILLED ROOT-CANALS.—Dr. Zierold, of Minneapolis, has suggested the use of xylol for dissolving out gutta-percha cones in imperfectly filled root-canals. It seems to work admirably.—*Dental Review*.

FRACTURE OF THE MANDIBLE IN CHILDREN.—In young children it is sometimes impossible to make a diagnosis immediately after the mandible has been fractured, except by the use of skiagraphy or by the aid of an anaesthetic; nor is it strictly necessary so to do. The parts are so much inflamed and swollen with effused blood that, even if a fracture were detected, it would be harmful as well as painful to apply pressure in any form over the swollen tissues. After a few days most of the blood and exuded lymph will have become absorbed, the inflammation will have subsided, so that the mouth can be opened to a greater extent, and a more thorough examination made with a view to diagnosis and subsequent treatment. Even if wiring of the bony fragments be contemplated, this operation is rendered far easier and less risk of sepsis is incurred if it be delayed until absorption of some of the inflammatory exudation has taken place. Fractures in children can usually be treated satisfactorily with metal gutta-percha, or poroplastic splints molded to the outside of the jaw. In adults, if there be but little tendency to displacement of the fragments, the same methods will suffice.—*F. Coleman, Ash's Monthly*.

THE FLAT LOWER JAW.—The dentist who has not had the experience in his own mouth of that problem of the mouth, the flat lower jaw, as I have had for twelve years, has not the least conception of what the patient has to undergo in becoming used to a denture on such a jaw. The result has been that I have learned some things which I could not otherwise have learned.—*Le P. Hadrell, Chicago, Ill. (Dental Review)*.

EMERGENCY REPAIR OF RUBBER BULB OF CHIP BLOWER.—The break in the rubber bulb of a chip blower may be covered with a thin layer of cotton, which is painted with collodion and allowed to dry. This repair will last until a new bulb can be secured.—*J. S. Walker (Western Dental Journal)*.



Complimentary copies of Oral Health will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

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TORONTO, FEBRUARY, 1916

No. 2

EDITORIAL

War Time Demand for Dentists.

SPECIAL SUMMER SESSION, R.C.D.S.

WAR conditions have occasioned an acute shortage of Canadian dentists. Aside from the 125 licentiates who have joined the recently organized Canadian Army Dental Corps, and who are either overseas or working in one of the many concentration camps in Canada, a large number of Canadian dentists have joined other branches of the overseas service. Canadian battalions are being recruited with such rapidity that the serious problem of supplying an efficient dental service for these forces now confronts the Canadian Army Dental Corps. In addition to this demand, the members of the C.A.D.C. overseas are literally working night and day, and their numbers will have to be greatly augmented in the near future. In many cases the corps is so undermanned that little more than temporary relief from pain is undertaken. These factors indicate an increasing demand for Canadian dental surgeons as the war progresses.

The time has passed for Canadian dentists to join any branch of the service other than the Army Dental Corps. The need for dental surgeons is so great, and the number of qualified men is compara-

tively so limited, that no citizen qualified to practise dentistry can be spared for other branches of active service.

The Royal College of Dental Surgeons of Ontario has a total registration of 323 students, made up of 109 freshmen, 86 sophomores, 72 juniors and 56 seniors. The great majority of members of the senior class, who are now about to graduate will, in all probability, go overseas as members of the Dental Corps. A special examination has been provided for all undergraduates whose military duties call them away from college before the regular spring examinations. This special examination made it possible for a student to get credit for his year's work, and was made available upon application at any time following the 15th of February, 1916, and was concurred in by the University of Toronto.

It has now been decided to hold a special summer session for the present sophomore and junior classes. This will eliminate the usual summer vacation and enable juniors to graduate next fall instead of the spring of 1917, and sophomores to graduate in the spring of 1917 instead of the spring of 1918. Not all of the members of these classes will attend, but a sufficiently large number will no doubt attend the summer session to assist materially in meeting the unusual demand for dentists, which will surely obtain during the balance of the war. The summer session will cover the regular work of the course and regular fees will prevail.

Upon graduation, students who have availed themselves of the summer session will be issued certificates, provided they attach themselves to the Canadian Army Dental Corps. Upon the other hand, if the graduate does not join the C.A.D.C. his certificate will be withheld until the time that he would ordinarily receive it.

The Board and Faculty of the Royal College of Dental Surgeons of Ontario are to be congratulated upon this arrangement, which seems to meet a special need in a very satisfactory way.

A Modern "Rip Van Winkle."

IN the *American Journal of Surgery* for February appears a prominent editorial entitled "Concerning the Teeth," in which statements are made concerning the dental profession that are so absurd and strikingly foreign to the real facts as to make the reader wonder whether the editor were perpetrating a strange joke on the readers of that valuable journal, or whether, as is most likely, the writer has been in the land of professional slumber for the past "twenty years." What will the members of the dental profession in the State of New York, who have for the past "twenty years" been in the van of the dental profession educationally and scientifically, say, think, and do, when they read the following quotation from the said editorial?—

"Medicine until very recently has failed to take cognizance of the teeth. Dentistry developed as a cognate but independent art. With meager preparation in the fundamentals of pathology and the principles of surgery, dentists have gone on in their own way practicing this very important branch of surgery. So long as they confined themselves to extracting decayed teeth and making artificial dentures to take their places, they were well within the range of their capabilities; but when they undertook the treatment of teeth which had lost their blood supply and innervation and had become foreign bodies, a degree of knowledge was required which the education of the average dentist did not provide. Thus for a long period root-canals, containing dead nerve and other structures, encased in a mineral wall, have been closed and hermetically sealed with caps and fillings.

"In the course of time the tendency is for these canals to become infected, either directly or through the blood and lymph streams. Being closed externally by caps and fillings, drainage is impossible. The infection proceeds inward, passes through the apical foramina, and attacks the socket lining, and then the bone at the apex of the socket. The backwoodsman and the poor, not having access to dentists, permitted their teeth to rot off, and thus were always provided with drainage of their root-canals; they have been spared the physical ills and disasters which visited those who thought they were more enlightened and who went about with "a mouth full of gold." It is difficult to think of a more dangerous and unsurgical procedure than the sealing in of root-canals, containing dead animal tissue; but this is what dentistry has been doing for the past twenty years. Perhaps we should not say dentistry, but dentists; because there have been a few enlightened men in this profession who have understood the pathological principles involved and have conscientiously cleaned out and filled root-canals down to the very apex before sealing the canal with cap or filling. Still the great majority of people, who have undergone dental operations upon dead teeth, have had this surgical crime perpetrated upon them."

* * * * *

The editorial was signed J. W. P., and containing statements such as have been quoted needs no comment. Perhaps the less said the better. It sounds its own death knell. However, it would be interesting to know who has been J. W. P.'s dental advisor during those dreadful "twenty years" of pent up infection.

We humbly commit the whole matter, including the twenty years of slumbering infection as well as the dental education of J. W. P., to the tender mercies of the New York State Dental Society with the most respectful request that all precautions be taken to avoid any somnambulistic relapse during the next decade.

The Lack of Dentists at the Front.

A DENTAL surgeon, F. Newland-Pedley, writes to the *Lancet* for January 29, 1916, to the effect that he had read in the *Temps* of Paris, that a bill was about to be introduced by the French Minister of War to provide an army dental service. It was proposed to incorporate the qualified dentists in the hospital service and to create an army dental corps with the rank of adjutant, providing a service at the front, in the hospitals, and wherever troops were likely to pass. Thus Australia, Canada, and France admit the need of a special corps, and no doubt they have found that at the front it is the dentist that is required more than the doctor. The Medical authorities seem determined to shut their eyes to one of the chief needs of the army at the present moment. We shall soon have millions of soldiers in the field, says the letter writer, yet it has been recently stated that the number of army dental surgeons in France, exclusive of those with the Canadians, is only forty-three. Meanwhile many young unmarried dental surgeons and students will come under the new conscription law, and unless the authorities show a little better appreciation of the wants of the army nearly all these young men will be drafted into the ranks of the combatants, whereas they ought to be formed into an army dental corps, which is so urgently needed. Great indeed has been the obstinacy of the authorities in opposing this project.—*New York Medical Journal*.



MAJOR W. B. CLAYTON

Acting Director of Dental Services, Canadian Army Dental Corps

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, MARCH, 1916

No. 3

Partial Dentures

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OUT of that which is unquestionably the big thing in dentistry to-day, namely, clinical and X-Ray proof of frequently grave and occasionally fatal systemic disorders arising solely from centres of infection, and these often at the end of imperfect root canal work, unsuspected dead pulps and similar, aggravated by poisons arising out of improper digestion due to imperfect mastication, and admixture with saliva of bacteria and bacterial poisons resulting from sore, loose, or discharging teeth, irritating and unsanitary crowns or bridges, improperly made and gum margin destroying clasps, impinging rubber saddles, and other all-too-frequent offences against good dentistry, arises, next in importance to the need of a rational root canal and periodontal treatment within the reach and means of the public through the average and near-average dentist, the need of a simple, sanitary, non-irritating and mechanically efficient system of restoring lost teeth, also well within the reach and means of the public through the average and near-average dentist and his efficient and faithful ally, the laboratory man. With the indications pointing strongly at the present time towards extraction of all roots or teeth shown by clinical signs and X-Ray to be not amenable in a reasonably short time to known methods of treatment and apex surgery, as well as a strong disinclination on the part of the thinking dentist to cut into healthy teeth, the engineering aspect of the average semi-edentulous

mouth, after these preliminaries are disposed of and the remaining teeth and roots are healthy, will show a considerably less number of anchor teeth or roots for the future artificial appliance than heretofore. The writer confidently believes that a glorified descendant

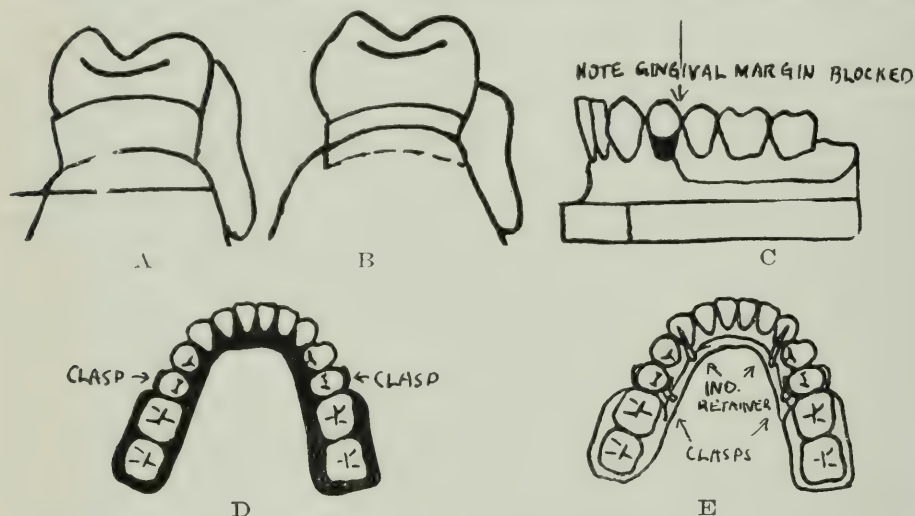
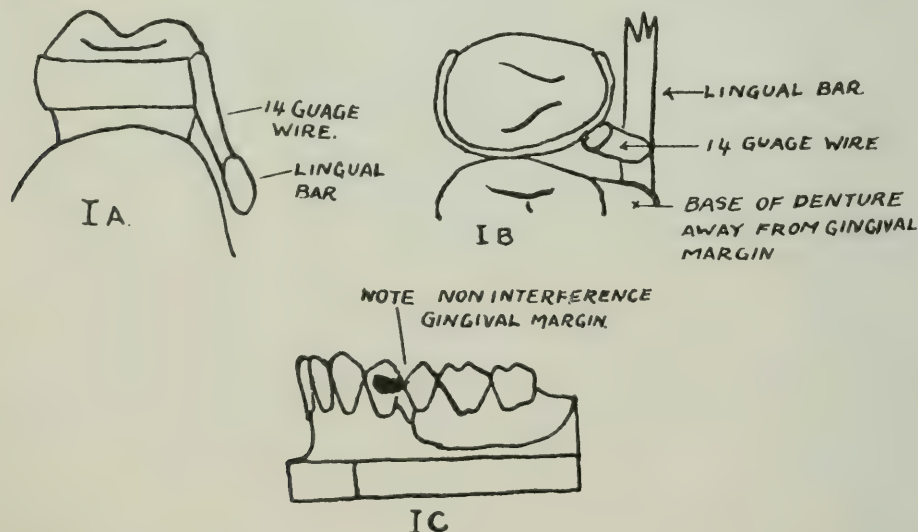


Figure 1.—A common example of destructive dentistry, clasp fitted to the gum with high lingual base. (a) Before "settling" invariably produces caries. (b) After settling produces caries and pyorrhea. (c) Common example of above vicious dentistry; rubber or gold stringer with fitted clasp. (d) Ditto seen from above. (e) Proper construction. See Indirect Retention.

of the present "ordinary" partial dentures and fixed bridges (both faulty in so many respects) bearing the hyphenated name of removable-bridge-partial-denture, or better still, just partial denture, will largely solve our problems for all forms resting on the mucosa, or teeth and mucosa; removable, sanitary, non-irritating to gingival margin, comparatively simple, and therefore inexpensive to



Proper construction for above. (a) Proper clasp fitted and contoured to opposing convex surfaces: at point of widest cross-section joined to base or lingual bar with 14-gauge wire. (b) Showing position of base of denture, bar and 14-gauge wire (latter in embrasure). (c) Side view of above. Note clear gingival margin.

construct, capable of modifications in event of loss of teeth or roots, and, best of all, well within the reach of the pocketbooks of our patients and the handicraft of ourselves and of our laboratory associates, the latter combination necessary for economic and maximum production.

Partial dentures may be said to be artificial restorations resting on the mucosa, or mucosa and teeth, and usually retained directly or indirectly by natural remaining teeth, the weight of mastication carried by the mucosa, and in many forms with the assistance of the teeth themselves; this preferable wherever possible, as teeth will bear roughly from six to ten more stress than the mucosa. Strictly speaking, a bridge, be it fixed or removable, rests on roots only without the assistance of the mucosa, as in the sister science of engineering, in which bridges, in spanning an interspace, rest upon prepared abutments.

A study of partial dentures involves, in addition to certain general considerations, a study of the natural teeth (unaltered or prepared for abutments), presenting most frequently for the retaining force; and the various parts incorporated in the removable artificial parts, such as retaining devices, bases (preferably metal), to which the teeth are connected by the attachment, usually vulcanite, better, gold, or porcelain.

GENERAL CONSIDERATIONS

Partial dentures in the years that have passed have acquired a reputation as caries and pyorrhea producers second to none, chiefly from one or both of two reasons. Of these, perhaps the place of honor (?) might be given that peculiar and universally used and universally-to-be-condemned form of clasp which snugly fits the tooth around the gingival margin, holding by capillary attraction decomposed food in solid and dissolved form at a position on the tooth least able to resist caries, and which, after settling of the piece has occurred, adds periodontal destruction to caries production. Thus the melancholy cycle proceeds rapidly and surely to destruction of the tooth. The second place on the roll of tooth tissue destruction may be safely given to that unfortunate form of saddle, or mucosa-touching element which, be it gold or vulcanite, is carried high on the lingual margin of the tooth, covering and riding up and down, and irritating the gingival margin also to its sure and rapid destruction. Fig. 1 and 3. Concerning the pathology, Dr. Harold Box, of the Department of Pathology, Royal College Dental Surgeons, says in part:

"The attitude of the dental profession to-day toward the preservation of the gingivae shows that this subject has become one of vital interest to all of the better class of men in the profession. We know that this tissue is the place of origin of serious pathological conditions

which are attracting a great deal of attention to-day from practitioners in general medicine and surgery.

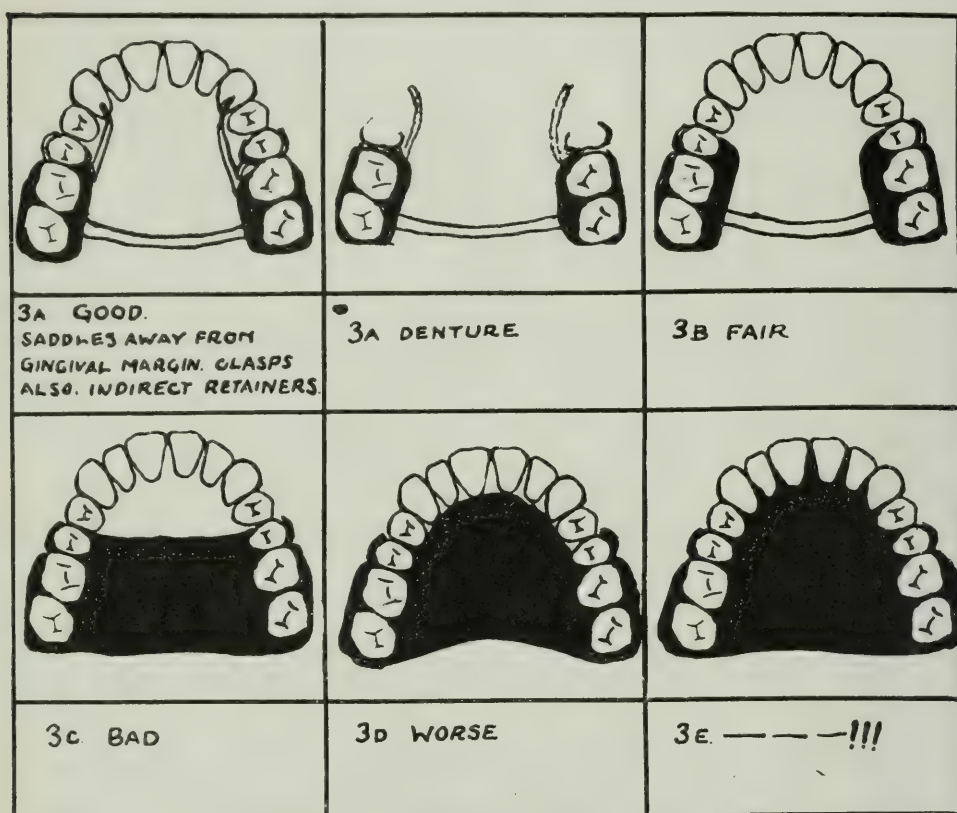


Figure 3.—Series of designs for identical condition (front ten in, balance absent) of diminishing quality. Note complete lack of gingival interference in 3A and the reverse condition in 3E.

“Examination of histological sections showing the gingivae in its proper relationship to the surrounding tissues, shows that this tissue is divided into three parts—the body, the free gingivae and the septal gingivae. We can see in a glance its close relation to the peridental membrane and the alveolar process. The body rests on the alveolar process, and is attached to it by the fibres of its periosteum. It is attached by the first group of fibres of the peridental membrane, known according to Black as the free gingival group, to the roots of teeth at their gingival portion. The free and septal gingivae rise from the body and surround the enamel of the crown of the tooth at the gingival. The space between the enamel and the free gingivae which covers it is known as the sub-gingival space.

“Where a clasp, on account of settling or from other causes, has come to the rephth of the sub-gingival space and has impinged on the peridental membrane, an intense irritation is set up. An increased supply of blood to the part follows, and inflammation is established. Deposits of fermenting and decomposing food are rarely absent, this giving an added irritation and adding caries production under the

most favorable circumstances. Infection follows, and part of the periodontal membrane is destroyed. We know that no alveolar process over any part of the root will remain without a periodontal membrane. When this is broken in any part, the alveolar process to which this portion is attached is absorbed.

"Again, when any part of an appliance rubs or presses on the gingivae in such a way as to make an irritation, nature, as in all injuries, tries at once to remove it and sends an increased supply of blood into the dilated blood vessels. To make matters worse, in most cases the surface of the enamel in the sub-gingival space has been etched, owing to the dissolution of the cementing substance from between the enamel rods by former fermentations. Continued pressure of the free gingivae against the sharp enamel rods creates an injury to the inner portion of this tissue, greatly adding to the inflammatory and caries producing condition.

"Nature, being unable to remove the sources of irritation, at once undertakes to remove by absorption the crest of the alveolar process, so that the injured tissues may fall to a new level and return to a state of health."

The above process continues to one of two endings, either a removal of the offending clasp or saddle and the substitution of a proper clasp or saddle kept in each case well away from the gingival margin, or the certain destruction of the tooth, either from pyorrhea, caries, or both.

The clinical experience of all, as above interpreted, offers a convincing proof of the first and most important essential in design of a partial denture, or, for that matter, any kind of artificial restoration of lost teeth and associated tissues, namely, *the necessity for keeping all parts, be they clasps, bands, half bands, hooks, saddles, bars, etc., away from the free margin of the gum, let alone sinking between the root and the free margin.* Removability is also a prime requisite, as is skeleton design, using bars of oval stiff wire, joining saddles, united by solder, rather than covering the whole of the remaining vault or gingivae with metal plate, except in instances in which adhesion is desired as an auxiliary retaining force. (Fig. 3.) Non-interference with the natural movement of the teeth and roots, as clearly demonstrated by Dr. Herman S. Chayes, of New York City, is also a prime consideration in design. The use of interlocking retainers with curved contacts permitting this, and permitting free up and down movement of partial denture, following its elastic mucosa-support, the springy character of the skeleton metal construction, and the more or less cushion-like characteristic of the mucosa, all tend toward this end. Teeth or roots bear roughly from six to ten times the weight that the mucosa will sustain, and the obvious lesson in the design of partial dentures is, whenever possible, rests of 14-gauge wire, curved to prevent slipping away, resting in inlays placed in natural

teeth and soldered to saddles, at one or preferably both ends of saddles. (Fig. 4.) The above contingent with peridental conditions of the tooth or teeth, space for wire, and similar. Also the logical procedure, after the piece is completed and adjusted in the mouth, by careful use of carbon paper and stone, a slight cutting of artificial porcelain which will allow the natural teeth or roots to obtain and

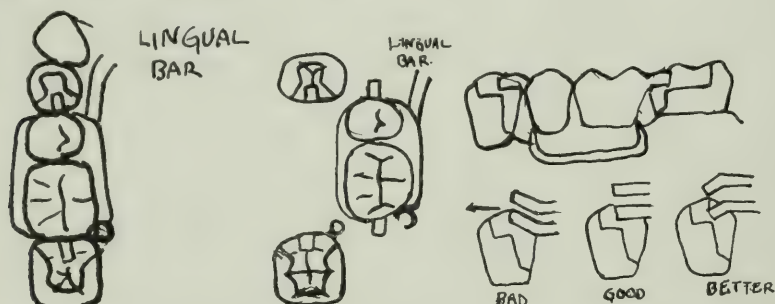


Figure 4.—Rests fitted in inlays, left hand drawings showing part of a bar lower, upper drawings sectional view of the same. Rests may be assembled on the framework of a denture, the wax pattern of inlay then made, and the denture with the rest or occlusal stud pressed home, allowing the rest to sink into the softened wax at masticating pressure on the denture; or the slot may be formed on the occlusal of the inlay, and the rest subsequently fitted to the inlay on the cast. In the latter procedure it is advisable not to solder the rest to the framework, but to try in the mouth with rest attached to the framework in wax only, thus securing a position of ridge-stress, and thus dividing the stress between the saddle and tooth in desired proportion.

carry a larger percentage of stress than artificial porcelain finding its ultimate support on the mucosa. Resultant stress of all kinds during function should be carefully worked out and the design conformed in such a manner as to place no undue stress on any part either of the artificial or natural mechanism. Some examples of the principle will be mentioned later under the caption of Clasp, Indirect Retention, and Anatomical Articulation. Designs should as far as possible provide for the extraction of a doubtful tooth or root and suitable and inexpensive readaptation of the partial denture to new conditions.

EXAMINATION.

Probably the first procedure following the initial appointment is the procuring of the history of any doubtful teeth or roots with skiagraphs of all, as well as a thorough examination into surface and peridental conditions. In event of doubtful success of accepted methods of root canal or peridental treatment, apical surgery or other known methods in a reasonable time, extraction, curettment, or similar treatment must seem necessary, for no precept of modern dentistry should be more scrupulously observed than the thus safeguarding of the patient's future or present health. Carious recesses should be either excavated or temporarily filled, pure phenol sealed with zinc chloride cement tending to desensitize without pulp-danger from its delayed removal. Any attempt at design of partial dentures while the health of any tooth or root remains in doubt may be subject to such revision as to result in considerable wasted effort.

STUDY MODELS.

Quite as necessary in the design of a partial denture (outside the extremely simple forms) to a dentist, as the blue prints to the architect or machine builders, are the study models or sketches or both. Stresses, resulting stresses, methods of retention, direct or indirect, space for constructional parts and teeth, necessity or no for opening bite, tooth or teeth involved if this is necessary, position and size of constructional parts (providing gold against gold, or gold against natural teeth rather than porcelain, avoiding excessive wear), and

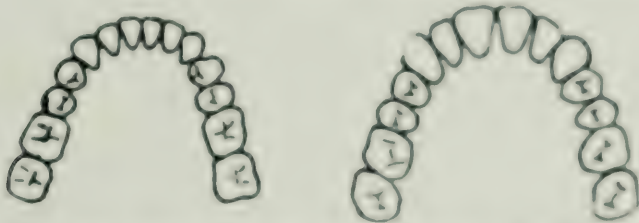


Figure 5.—Form for rubber stamp for tentative sketches. All the designs in the article were worked out from this above form. Any rubber stamp maker can make a stamp from inspection of above cuts.

similar preliminary considerations may all be plotted out with reasonable degree of accuracy. Preliminary to this, pencil sketches on a printed or rubber-stamped set of teeth of 14 (Fig. 5) (third molar may be sketched in if necessary) may be quickly made until a suitable design is evolved.

ABUTMENTS.

While any lengthy discussion on prepared abutments might seem more relevant to a discussion of crown and bridge work than of prosthetic dentistry, yet, with the increasing use of interlocking retainers soldered to these, the dividing line between these two branches is fast becoming so indistinct as to become obliterated entirely, and the writer feels justified in making a brief reference. At the outset, consistent with principles of mechanical efficiency and artistic harmony, each given due proportion in each problem, it may be definitely stated that *natural teeth should, in every case, be they either for retaining artificial parts in position, or assisting in the stress of mastication, or both, should be utilized, so far as they may be, in their natural and unaltered form.* This being impossible, *nothing further than the absolute minimum of cutting and alteration consistent with correct mechanical principles and future possible pulp affection should be attempted,* quite apart from the consideration of discomfort, liability to future pulp complications, loss of time, and additional cavity margin in the mouth of the patient, the ever increasing need of serving a larger number, and serving them well as well as economically. Our knowledge of root canal possibilities (and in many cases impossibilities in the hands of the average man) forms a very distinct background upon which this principle stands forth, and gives a new

importance for certain methods of retention, fallen more or less into disrepute on account of their misuse in incompetent hands (notably the clasp), as well as furnishing us with another notable series of possibilities given to us with the advent of the cast gold inlay in the direction of the retaining-element-carrying possibilities of these inlays.

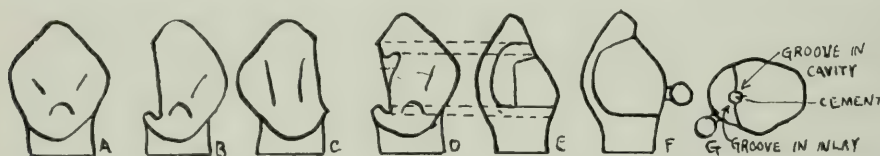


Figure 6.—Short preparation of cuspid for direct retainer element not carrying stress, as Roach, etc. (a) Uncut tooth. (b) First cut, shown from lingual, with knife carborundum stone. (c) Ditto viewed from labial. (d, e) Lingual and side views of next cut, made with fissure bur in the right angle handpiece. (f) Inlay with Roach ball in place. (g) Showing groove in inlay opposed to groove in cavity wall. (See Figure 7.)

Alterations by cutting of natural teeth seeming necessary, *the minimizing of this cutting, consistent with strength, should be always kept well in mind*. (Fig. 6.) In simpler forms of inlay, the placing of opposed grooves in the inlay against opposite opposed grooves made in the cavity after withdrawal of wax gives a very decided element of strength against dislodging stresses. (Fig. 6 G). In the compound forms the use of one, two, and sometimes three pins of



Figure 7.—A, B, C, D, showing use of opposed grooves in inlays in section. E, F, tapered locking pin suggested by Dr. O. S. Clappison, Hamilton, Ontario.

20-gauge metal, located in suitable positions, subsequently threaded to be received into holes also threaded, is of advantage in addition to above. In the M.O.D. forms the opposed groove and occasionally pins and diagonal tapered looking pins materially assist. (Fig. 7.) The necessity or no for devitalization in these instances is largely a matter of separate consideration depending on such conditions as age, history of pulp, behavior, X-Ray information, amount of caries, amount of stress to be borne and similar considerations. More extensive preparations involving pulp destruction seeming necessary,

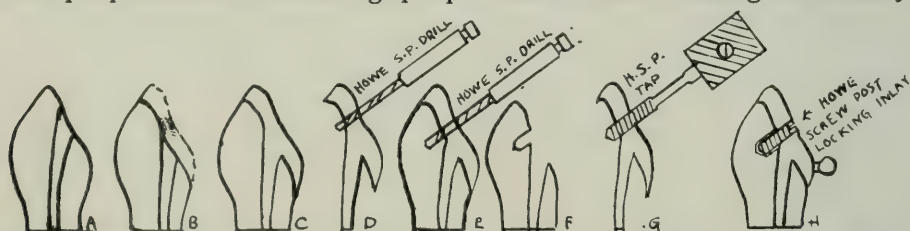


Figure 8.—Steps in construction of lock screw, using inlay and post as example. (a) Preparation complete. (b) Wax pattern and post fitted. (c) Inlay. (d) Hole for locking screw. (e) Ditto in tooth, drill guided by hole in inlay already made. (f) Hole in tooth enlarged. (g) Inlay being tapped. (h) Locking screw in position, turned permanently home while cement is still unset.

conditions appear more properly embraced under the caption of crown and bridge science rather than prosthetic dentistry. For restoration involving the anterior crowns upon which retaining elements are to be attached, the writer sees no objection to the lingual half band, provided that it is well fitted to a high lingual root portion and kept above the gum margin, which construction affords a decided gain in strength over the non-band forms against stress proceeding from the lingual, not to mention a decided minimizing of tooth cutting. For inlay with post, half-hood with post, and similar preparations, a locking screw made from the well-known Howe screw post and accurately fitted after cementation, mechanically provides against movement in the only remaining direction of egress. (Fig. 8.)



Figure VIII.—Two features of malconstruction which has brought the shell crown into disrepute (a) not contoured to shed food away from the gingival, and carried below the gum line, (b) Proper construction, contoured to shed food and away from the gingival margin, and kept well above gingival margin.

Properly constructed and placed, the shell crown (Fig. VIII.) has the cardinal advantage of strength which gives it its peculiar position in dentistry. From a root prepared to slightly converge from the gum line up, an impression and Spence's plaster compound cast is made, band fitted to this *above the gum line*, contoured to shed food away from the gingival margin, heated and inverted in softened hard wax, occlusal surface formed and carved in wax from a "bite" both in rest position and side movements, and subsequently cast; the crown then lined with soft wax, pressed back on the root, filled with Spence's plaster compound, and then reburnished, which will produce

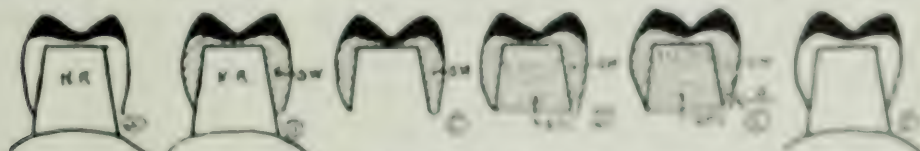


Fig. IX.—Steps in correct adaptation of shell crown. (a) Fully adapted crown. (b) Ditto pressed back on root. Crown previously lined with soft yellow wax. (c) Ditto removed from tooth. Metal preliminary of crown shown, whose adaptation is correct, layer of wax when adaptation is not correct. (d) Crown filled with Spence's plaster compound. (e) Submerging the crown against Spence's plaster compound model. This is then cut out, and on turning the crown to the root. (f) Accurate fit is secured. A. R. Root, S. P. C. Spence's Plaster Compound.

a crown of such accuracy that when pushed to place the contracting periphery of the band adapts with greatest precision. (Fig. IX.) By the judicious use of the Howe screw post and gutta-percha cones placed in canals and removed from them in an amalgam matrix-restoration while still unset, preliminary to the preparation of the root to receive a shell and the forming of a space in the occlusal

of a crown, the treatment of the root canals may be continued after the splint bridge or crown has been cemented in position, frequently avoiding annoying delays. (Fig. X.)



Figure X.—Process of building up a root, leaving the root canals free for treatment. (a) Before. (b) How screw post fitted. (c) Gutta percha cones. (d) Amalgam restoration (matrix). (e) Gutta percha cones withdrawn, while amalgam is still unset.

Partial dentures are made up of a base, teeth, and attachment, usually vulcanite or gold (soldered or cast), and joining teeth to base, and retaining devices connected with abutment teeth. Retaining devices or forces may be divided into three general classes, one in which the denture is held in its position without interlocking parts attached to teeth, crowns, abutments, etc., such as adhesion, various clasps, cribs, etc., and another class consisting of special interlocking devices as Roach ball, and split tube, stud, ring and stud, wire and wire clasp (Gilmore), split wire and tube, and others subsequently referred to, and in each case connected with a fixed element attached directly or indirectly to teeth upon crowns, inlays with posts, splints, etc., and in a large number of cases rendering necessary devitalization of teeth concerned for firm attachment. The third, christened indirect retention, is an auxiliary used with either or both of the above. The great advantage over the retaining principle of the first-named class over the special interlocking devices of the second class, particularly in view of our present-day X-Ray knowledge of root canal operations, is easily patent, namely, that of *non-necessity of mutilation of teeth*.

SIMPLE RETENTION (DEVICES OF ONE ELEMENT).

CLASPS.

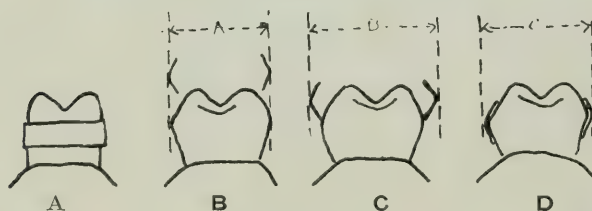


Figure 9.—Rationale of proper clasp action. (a) Tenso friction only, less favorable type. (b) Bell shaped type most favorable. Free ends of concaved clasp approaching* opposed convex surface of tooth. (c) Spreading of free ends of clasp to pass the point of widest cross section. (d) "Snapping" of clasp into position, as its free ends assume the same separation as in B.

Perhaps one of the most useful, yet widely abused and maligned methods of retaining artificial pieces in the mouth is the clasp, which, in a vast number of well-chosen, well-designed and

adaptable cases is pre-eminent over all of our newest and most effective forms of interlocking devices in this one respect of greatest importance in view of our knowledge of root canal possibilities (and impossibilities), namely, the non-mutilation of either teeth or pulp. In conjunction with an indirect retaining extension, of which reference will shortly be made, saddles of considerable length may be held firmly in position, supported by a single clasp at one end of the saddle only.

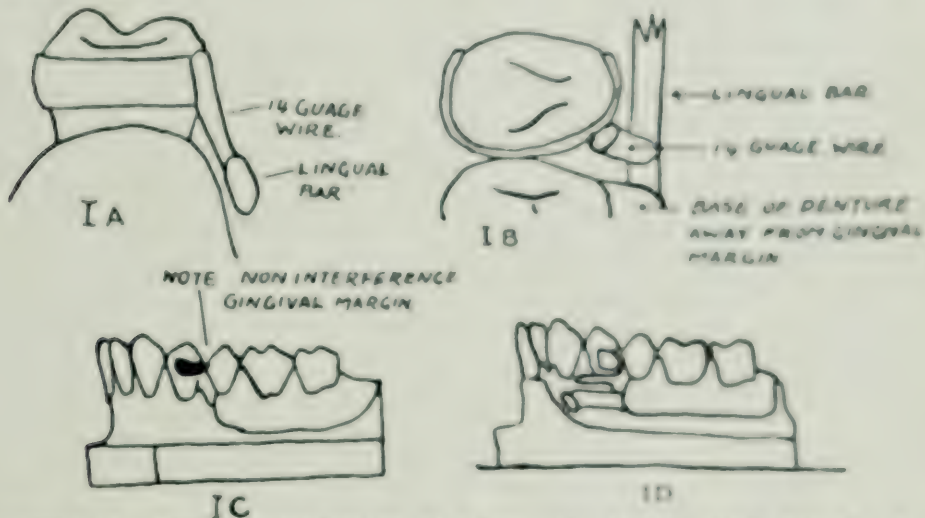


Figure 10—Proper construction of clasps. (a) Proper clasp fitted and secured to opposing convex surfaces. At point of widest cross section joined to base or lingual bar with 14 gauge wire. (b) Showing position of base of denture, bar and 14 gauge wire (latter in embossed). For side view of above. Note clear gingival margin. (c) Sectional buccal view of a spring connection between clasp and base, suggested by Louis J. Weinstein, New York City.

RATIONALE OF CLASP ACTION

While the rebound or spring of clasp against the tooth setting up a friction is an important factor in clasp action, and all important in the case of a more unfavorable type of tooth, namely, with parallel sides, yet the most effective clasps which go into position with that "snap" so grateful to the patient, are those which mechanically conform to the slight "bell" shape of the crown of that type of tooth peculiarly well fitted for clasp action. It may thus be noted that in order to attack or remove a formed band clasp from such a tooth, its free ends must be sprung apart to a distance proportional with the bell shape of the tooth, thus ensuring a mechanical locking of the clasp in position. (Fig 9.)

USE AND ABUSE OF CLASPS

The long bicuspid, molar or cuspid tooth (in order of preference), of good periodontal condition at the end of a series and of more or less bell shape well above the gingival margin, are teeth well suited to clasp. A clasp fitted to one such as above, carried almost three-quarter the circumference of the tooth, the lower margin of the clasp kept well above the gingival margin, and joined to the base by 14-

gauge flattened platinum and gold wire or 18-gauge curved or springy wire (Weinstein) soldered to it and to the base. (Fig. 10.) The writer desires to lay special emphasis on the necessity of accurately shaping the clasp. A tinfoil pattern (Fig. 11), a Melotte's

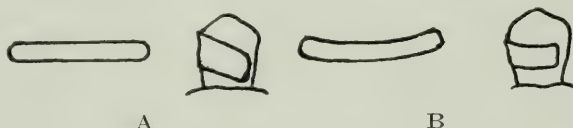


Figure 11.—(a) Usually a soft metal pattern for a clasp cut from a parallel straight sided piece of metal, when adapted tends to turn gingivally. (b) When curved as above follows the gingival margin about parallel distance.

metal cast of the tooth, from individual impression in plaster, free use of the contour pliers and rivetting hammer are necessary to secure the result desired, using 24-gauge clasp metal plate. Following this plan, many teeth heretofore considered unfit for clasps, as lower first bicuspids, cuspids, occasionally upper cuspids, may be effectively used, provided *opposing convex surfaces may be found and free ends of concaved clasp fitted to these.* (Fig. 12.) A clasp should be made of suitable stiff metal, cut curved, platinum alloy preferred, and should



Figure 12.—Choosing suitable opposed surfaces of the same tooth for a clasp. (a) Showing different opposed surfaces AA and BB. (b) Side view of opposed surfaces at AA, unsuitable for clasp as pressure of free ends of clasp tends to throw clasp off tooth. (c) Same at B viewed from above. (d) Side view of opposed surfaces BB suitable for clasp. Opposed convex surfaces to which free ends of clasp are concaved and fitted. (e) Same as D view from above.

be sufficiently wide to allow bulk of metal to ensure springiness (not less than 3 MM), in order to secure the maximum efficiency obtaining from the concaved-formed free ends of clasp pressing against opposite convex tooth surfaces. And most important of all, neither the clasp nor the base must ever touch, less impinge on the gingival margin, a construction which may be remedied in 95% of partial dentures now constructed by using the three-quarter clasp with 14-gauge wire to join to the base; a construction in no wise interfering with the health of the tooth and the surrounding tissues. (Fig. 10.) For short teeth, a narrow, thick cast clasp is indicated containing sufficient metal to give same grippy action as wide clasp on tooth. (Fig. 13.) On the



Figure 13.—The cast clasp is indicated where the tooth is so short as to require a band so wide as would sink below the gingival margin, were it to contain sufficient metal to give it spring. The same gripping spring action may be secured by the narrow thick cast clasp.

other hand, the misuse of the clasp, upon short, unsuitable teeth, or such crudities as the flat clasp close to the gingival margin, encircling a little more than half the buccal surfaces and merging into rubber carried high up on the gingival margin (Fig. 14A); the shaped clasp following the gingival margin (Fig. 14B); the band clasp between two short teeth with base high on lingual blocking the free



Figure 14—Various misuses of clasps and bases: (a) Flat clasp merging into base, latter high on lingual side of tooth and interfering with gingival margin. Shown viewed from side and from above. (b) Flat clasp close to gingival margin. A particularly frequent and vicious form. (c) Clasp fitted between two teeth, blocking flow of saliva and increasing tendency for caries and pyorrhea. (d) Clasp after "settling" adds pyorrhea to caries production. (e) Clasp on one side only, pushes tooth lingually. (f) Clasp fitted on both of buccal and lingual lean, resulting pressure of mastication forces tooth in or out. (g) Clasp above widest cross section pushes clasp off. (h) Clasp below widest cross section tends to push tooth out.

flow of saliva (Fig. 14C); clasps which do not allow for "settling" of a denture (Fig. 14D), and which, cutting into the gingival margin after a short period of use, clasps without lingual support, pushing the teeth lingually (Fig. 14E), clasps on teeth with lingual or buccal lean, pushing the teeth lingually or buccally on pressure of mastication (Fig. 14F), clasps above or below the widest cross-section, pushing the denture or the tooth out respectively (Fig. 14G), all result in a sequence of events tending toward the destruction of the tooth, attacking both the tooth itself and its very foundation in the alveolar process. In this connection it might be said that the vulcanite clasp, carried around the gingival margin of the tooth, has no place in dentistry. Similar in action is the Jackson "crib," primarily designed as a retainer in Dr. Jackson's system of removable orthodontia appliances, and later appropriated for prosthetic purposes, and useful it is in certain instances where a connection is desired in the middle of a series of properly formed teeth without any cutting.

ADHESION.

While the force of adhesion, of prime importance in edentulous cases, is of secondary importance in partials, yet, in certain cases in which its use would relieve the few remaining teeth of undue strain (Fig. 15) its importance is considerable. The original Greene method of securing impressions in such a case, modified by Supplee, using Kerr's compound, trays avoiding the muscle contraction, and

if necessary, the sectional method, allowing the impression of all but the labial surfaces of the teeth to be returned to the mouth with softened edges for muscle trimming until the impression passes a test for adhesion by remaining in position while the patient makes dislodging movements, and the subsequent adjusting of a separate piece of compound representing the labial surface, and finally the

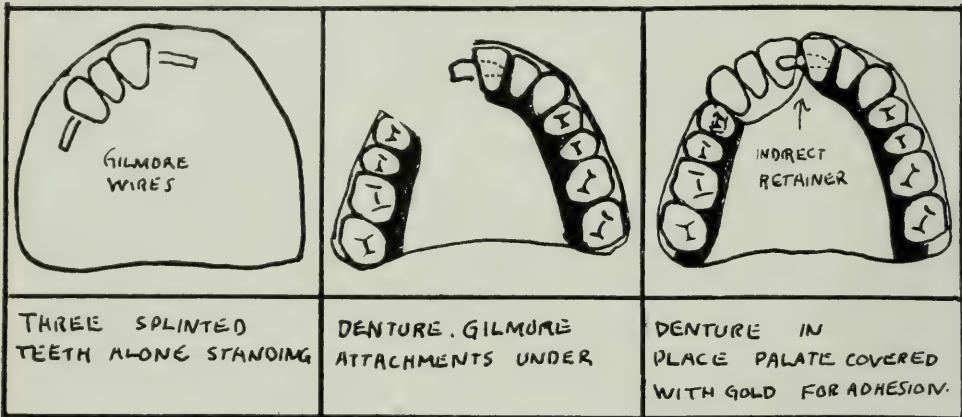


Figure 15.—An instance in which adhesion is used to relieve the strain on the anterior three teeth. This not being necessary, skeleton construction might be used. (See Figures 20, C. 2, C. 3.)

return of the impression to the mouth, covered with a thin mix of plaster, also with muscle movement adding to the result the accuracy of a plaster impression and drawing off any crowns, posts, copes, etc., in their exact relationship, will secure the highest degree of adhesion subsequent to compensation of the hard area mentioned later. In this connection, the study of impression methods for partial restorations would well fill a separate essay.

Adhesion depends on molecular attraction between a film of saliva and the base on one side and this film and the mucous membrane on the other, held in this position by capillary attraction.

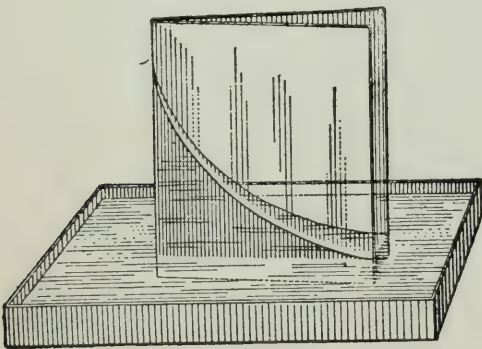


FIG. 183.—Water rises between the two plates of glass which touch along one edge.

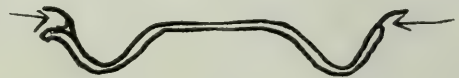


Figure 16A.—In denture construction the lesson of above experiment is accurate, adaptation at periphery. As the base and the mucosa tend to separate, likewise the capillary film becomes lost, and with it adhesion.

Figure 16.—Figure 183, from "Ontario High School Physics," showing the increasing quality of the capillary film as approximal surfaces approach one another.

Capillary attraction is lessened as the approximating surfaces become separated (Fig. 16), therefore it is especially necessary in securing high adhesion to preserve close contact at the periphery, avoiding, however, muscular contraction. It is patent also that the amount of adhesion is in direct proportion, not only to the accuracy of the adaptation, but also to the area of adaptation. Therefore the diminishing importance of adhesion in small saddles. The above-mentioned technique seems to the writer the most scientific method of securing adhesion of maximum efficiency and in harmony with physical laws.

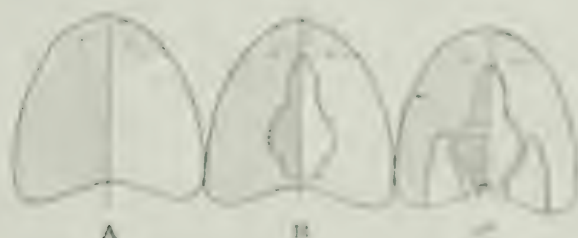


Figure 17—(a) Uniform density. (b) Hard area in centre, balanced uniform density. (c) Hard area in centre, soft areas on either side, balanced uniform density.

In examination of mouth for hard and soft areas, the roof of the upper mouth and a lead pencil being close at hand, a round headed instrument is held lightly in hand and drawn across the vault as indicated by cross lines, one side at a time from ridge to median line. In vault A no difference of density is encountered, in vault B the instrument finds up a hard area outlined in centre, in vault C hard area in centre and soft areas on either side are detected, each noted on cast as detecting.

TREATMENT OF HARD AREAS

In the median line is found in most upper mouths the only portion of the mouth which it is said never changes, usually harder than any other portion of the mouth. In constructing bases which cover part of the so-called hard area, cognizance should be taken of the fact that the central area is practically unchangeable while the balance is to a small degree subject to change. This may be done in the case of a saddle covering all or considerable portion of the vault by plotting out on the model, from a careful examination of the vault (Fig. 17), the outline of the central hard area on the cast and subsequently reswaging the base (Ash press) upon a piece of soft lead from 16 to 24 gauge (depending on the amount of the difference of density between the hard area and the rest of the mouth). (Fig. 18.) This at first results in a small recess above the hard area upon which the base loses contact, and therefore adhesion, which is partly made up by the outside pressure on the rarified air within, and after "settling" is complete, contact in that area is restored, with subsequent adhesion by contact with capillary film of saliva.

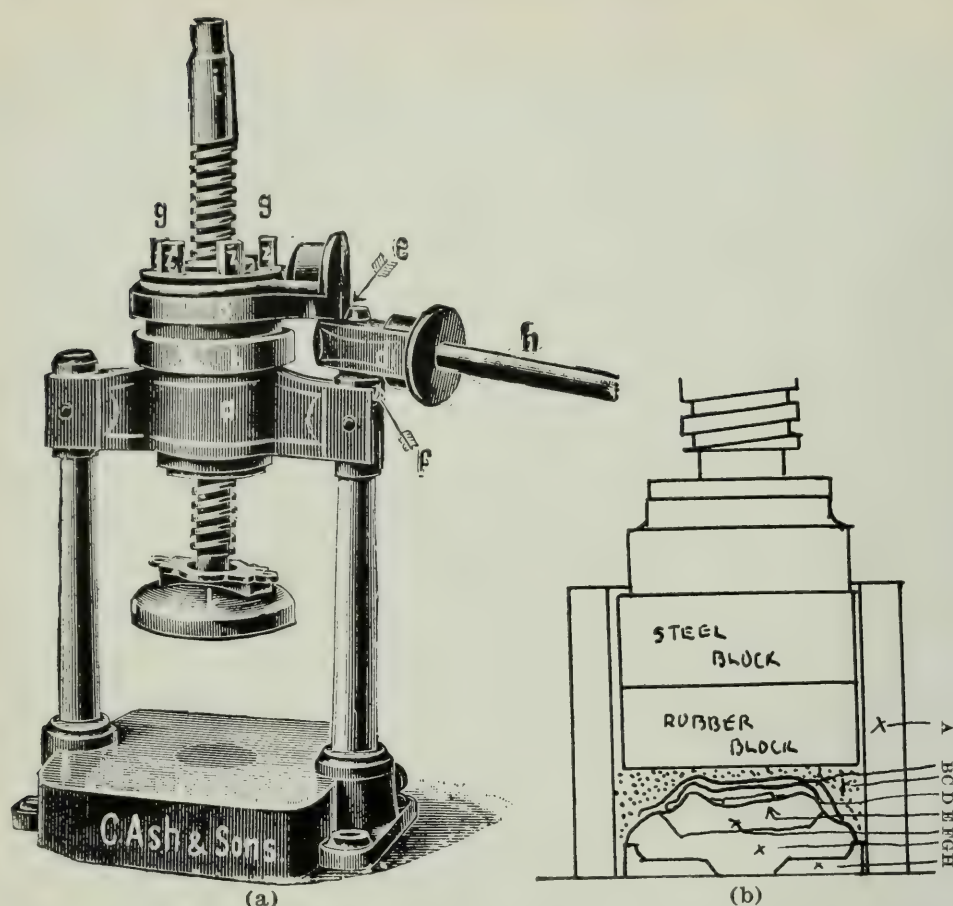


Figure 18.—(a) Deutcher Differential Press of C. Ash and Sons, London. Note double leverage exerted on screw resulting in high pressure on block. (b) Showing reswaging process in section. The writer uses a steel tube cut from a solid cylinder of steel, with walls 5-8 inch thick, (A) instead of the cast iron cup provided with the press. The flask or oiled circular plate (H) in which the Spence Plaster Compound cast (F) is bedded (G), occupies the bottom of this. Next comes a sheet of thin lead (E), cut to the shape of the hard area (Fig. 17), next the base to be reswaged, then a sheet of rubber dam (B), then a quantity of finely divided rubber (B), over this the rubber block (hard) and steel pressure block. The use of finely divided rubber is a distinct advantage over the use of the rubber block alone, resulting in better adaptation at the periphery of the base to be reswaged, due to the more fluid-like characteristic of the divided rubber over the solid block. The swaging complete, the steel tube (A) and its contents can be moved off the press over a box or drawer, and the whole contents dropped through the bottom and recaptured. Should the box or drawer in which the finely divided rubber is kept be some little distance away, a piece of sheet metal should be used under the tube (A) enabling the tube and its contents to be carried without spilling. (See article in Review, August, 1914, Dr. H. Goslee.)

(To be continued in April issue.)

S. S. White Honor Roll

THE following employees of the S. S. White Dental Mfg. Co., Toronto, have enlisted for overseas service:

Keats, Louis, Sergeant 8th Canadian Mounted Rifles.

Robertson, James, Corporal 2nd Division Cyclist Guides.

Derrick, Reginald, Private 2nd Division Cyclist Guides.

Harris, Kenneth M., Sergeant C.A.D.C.

Thompson, Laurence E., Private 201st Battalion Toronto Light Infantry.

The Successful Practice of Dentistry*

WALLACE SECCOMBE, D.D.S., PROFESSOR PREVENTIVE DENTISTRY AND DENTAL ECONOMICS, ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO.

THERE was never a time when more exacting demands were made upon the dental surgeon than the present. Changes in the science and practice of dentistry are so rapid that a practitioner may become old-fashioned in five years. Fifteen years ago the younger members of the profession were universally considered more modern in their practice than were the older graduates. That time has passed. Advances have been so rapid that it is not now a question of being old or young, but whether you are abreast of the times. The advantage has gradually passed from the younger graduate to the older man, who is familiar with the best thought of the profession and is able to bring his wider experience to bear upon modern methods of practice.

The standard of dental service is being continually raised. The dental graduate who leaves college to-day with the impression that he can settle down comfortably to the practice of dentistry, dispose of his college texts, ignore dental magazines and dental meetings, stamps himself, at the very outset, as a complete failure. Likewise, the older practitioner who has failed to study the later dental works and has thought himself too busy to attend dental conventions is also a failure. He does not render that high quality of service which his years of experience would otherwise make possible.

Heretofore, there have been those who have argued that the practice of dentistry would never assume the importance of that of medicine, because in the one case a tooth was at stake and in the other a life. The logic of that argument has been destroyed through the discoveries of science, that the presence of rheumatism, neuritis, endocarditis, gastric ulcer, nephritis, and other systemic lesions are due, in many cases, to local foci of infection about the roots of teeth. Rosenow has established conclusively the facts concerning the translocation of streptococci, the organism having, in one instance, an affinity for the joints; in another, for the appendix, or in still another for the stomach.

For many years the dental profession has recognized the relationship between septic conditions in the oral cavity and many systemic diseases, but that knowledge has been based largely upon clinical experience. Through the observations of Hunter and Osler, and the

*Read before London Dental Society, 18th February, 1911.

Read before Toronto Dental Society, 5th March, 1911.

Read before Hamilton Dental Society, 11th March, 1911.

experiments of Rosenow, Billings, Gilmer and others, the direct relationship between local foci of infection in the oral cavity and systemic conditions of disease has been scientifically shown. The result is that leading members of the medical profession have come to regard dentistry as a most important factor in preventive medicine.

Now what does all this mean? It means that the practice of dentistry is a matter not of saving the teeth alone, but of preserving life and health. It means that much of the present practice of dentistry will be revolutionized. As a profession we shall have to adopt an entirely different attitude toward the question of the vitality of the teeth and the treatment of those roots that are comfortable and apparently healthy, and yet are maintaining a source of systemic infection. It means that the public will appreciate the importance of aseptic root canal work, and will, because of the vital issues at stake, demand that dental service be rendered in conformity with the most advanced methods of practice, and be more willing to pay adequately for that service.

Now let us turn for a moment and ask ourselves the question: What is the successful practice of dentistry? The successful practice of dentistry might be defined thus, the rendering of the best possible service, under the most agreeable conditions, and the acquirement of fair remuneration for the service so rendered.

When we speak of "rendering the best possible service" we are dealing with a variable factor. The service rendered by one dentist may be a very different service to that rendered by another, though in each case the service may have been "the best possible." It is likewise true that circumstances may compel, in different patients, different treatment of similar conditions, and though the operator be the same, and though he may render the best possible service under the circumstances, the service rendered in each case may vary.

Rendering service is, after all, the most important factor in successful practice. Unfortunately, skill and success are by no means synonymous, though a distinct relationship exists between them. Better dentistry makes for success, and success encourages better dentistry.

There are many dentists, skilled in the science of dentistry, who fail entirely in the successful conduct of a dental practice. Upon the other hand there are those possessing only average skill, who apply correct principles in the management and control of practice, and who, therefore, meet with a fair measure of success. Every member of the profession should aim to be, not only a skilful dentist, but a successful dentist.

The recognition of the successful dentist is much easier than his analysis. Under the microscope he proves a most elusive individual, and consequently we will approach our subject from the synthetic standpoint and study a few of the factors which make for success.

To attempt any set formula would be as foolish as it is impossible. Thoughtless imitation must be avoided, for, after all, the greatest success for any man is the highest and best possible development of himself. We are not, upon this occasion, so much concerned about the creation of some fanciful character that we may emulate, as we are anxious to study the fundamentals upon which success is built, that we may, each in his own way, endeavor to apply these principles to his individual problems and harmonize daily conduct with those laws which govern successful practice.

It is interesting to study the evolution of the dental profession's attitude toward this question. In the early days attention was focused upon the service to be rendered to the exclusion of almost every other consideration. Later the thought of the profession was directed toward the rendering of the service under the most agreeable conditions. This naturally led to the study and use of every approved means for the relief of pain, the acquirement of the best dental equipment, and the adoption of well appointed and pleasant office surroundings.

The third requisite is equally essential to successful practice, namely, the acquirement of a fair equivalent for the service rendered. An equivalent to be fair must be intelligently fixed. Haphazard methods in this important matter works nothing but injustice to both patient and operator. It is simply a question of equivalents. To render a service without proper remuneration is unfair to the operator. To secure a fee without rendering the best possible service is equally unfair to the patient. In either case an element of dishonesty enters and failure results. Unless economic law operates successful practice is impossible.

GENERAL OFFICE MANAGEMENT.

One of the most common mistakes is to make too many appointments during the day. Many men cling to the half-hour appointment plan instead of adopting the hour basis for appointments. In place of fourteen patients in the day, the general practitioner should receive one-half that number. The reception of a patient, removal of wraps, sterilization of instruments, adjustment of operating chair, preparations of operator, obtaining history of case since last treatment, the preparation of the operating room for next patient, with the few passing words of greeting and farewell, that the ordinary amenities of life demand, consume, at the lowest estimation, five minutes at either end of each sitting. This means ten minutes for each patient, and if appointments are made for seven more patients than are necessary, the total loss of time each working day is seventy minutes. This, in effect, is just the difference between leaving the office at five o'clock rather than ten minutes past six.

Furthermore, the half-hour appointment plan makes it almost impossible to overtake the schedule, following any unavoidable delay.

This usually results in a number of patients waiting in the reception room, and this, in turn, diverts the attention and interest of the operator from the work in hand. His mind attempts a solution of the problem of how to get these three or four patients out of the office in the least possible time, but before he accomplishes his design yet another patient may arrive, and so the process continues, with loss of time amounting to many hours in the aggregate, and no single case appreciably advanced toward completion. This, in a word, tells the story of a simple inlay restoration, taking six sittings to complete, extending over a period of six weeks of time and a fee of six dollars. Result—waste of patients' time, and a direct financial loss to the dentist, who cannot honestly charge more than the service would have entailed if carried to a conclusion in the most expeditious way. The habitually crowded reception room indicates a lack of good management and is all too prevalent. In dental offices where the most work is accomplished there is no sign of crowd, rush or hurry. These symptoms manifest themselves in the offices where gross receipts are correspondingly low.

A fixed consultation hour from four to five is a decided advantage, being available for examinations, short treatments and consultations. A fee should, of course, be charged for consultation in those cases where the treatment is not proceeded with.

Another important consideration is the proper and sufficient ventilation of the office and the maintenance of the atmosphere at a fixed temperature. This point should be that degree of heat which will enable the operator to work at his highest point of efficiency. This will be found to be many degrees lower than that which prevails in the average office. Thermometers are cheap. Place one in each room and make it the duty of your assistant to see that plenty of fresh air enters and a fixed temperature is maintained. This degree may be too low to keep certain patients comfortable, but in such cases the use of a steamer rug, thrown over the patient, will overcome this difficulty. Fresh air in the office will not only increase and improve output of service, but is also a decided factor in the maintenance of the dentist's greatest asset, namely, good health.

PREVENTIVE DENTISTRY.

In rendering the best possible service we must practise all that is known of prevention. The dental profession is constantly urging the claims of oral hygiene as a health measure, and in the profession's public oral hygiene propaganda, prevention plays a very important part. Does the average dentist practise personal oral hygiene? What would an examination of the mouths of the dentists in this room disclose? Do we practise oral prophylaxis for our patients, or just clean those surfaces of the teeth that are practically immune and that the patient can see? Does prophylaxis mean to us the polishing of those surfaces of the teeth that are most susceptible to caries?

Are we in earnest? Do we really practise what we preach in regard to prevention?

No crown, bridge or other restoration should be put in place until the patient has acquired the habit of proper daily care of the mouth. How much greater will be public respect for dentistry when patients are told that a crown or bridge or other restoration will not be inserted until sufficient knowledge has been acquired by the patient to intelligently cleanse the mouth and sufficient interest shown to perform that duty with regularity.

A system designed for the periodic notification of patients to return for dental examination is essential to the effective practise of preventive measures. The plan usually followed is for the office assistant to fix an appointment when the pre-arranged date is reached. An appointment card is then issued and sent to the patient with an intimation, somewhat as follows:

The enclosed appointment has been made in compliance with your request for regular dental examination and treatment.

Only patients who clearly understand the motive prompting such a plan should be included in this service, and only then at the specific request of the patient.

PAINLESS DENTISTRY.

No dentist can honestly promise to render painless service, and yet it is important that every operator should cause the minimum of pain. Painless dentistry, in so far as that may be possible, has a decided economic value. It is the judgment of the writer that fifty per cent. of the pain and discomfiture of our patients at the present time could be eliminated by the use of sharp instrument, a true-running dental engine, sharp burs and abrasive stones that don't wobble.

ANNUAL OFFICE BUDGET.

At the beginning of each year an office budget should be prepared covering fixed charges, overhead expenses and all sundry items, including the salary to be drawn by the operator. From this budget an average hourly fee may be struck for the year.

This budget should be prepared at least once a year, or at a time in the interval when the overhead charges of the office appreciably increase or decrease, as, for instance, in case of:

Increased or decreased rent;

Increased or decreased salaries of assistant or laboratory help;

Increased or decreased salary of dentist governed by

- (a) Demand for services;
- (b) Speed, skill, experience;
- (c) Cost of living.

Thus the dental fee is automatically adjusted to conform to economic law. As an operator becomes older and works less rapidly, or there is a diminution in the demand for his services or a decrease in the cost of living or in office expenses, the average fee would be reduced, and conversely, as an operator increased the service rendered in a given time through increased skill, experience or speed, or the cost of living or office expenses increased, the average fee would automatically increase.

This budget for the average dental practice in an Ontario city would work out about as follows:

Capital Account—

College expenses per session	\$450 00	
Value of student's time	500 00	
		950 × 4 \$3,800 00
Equipment of office		1,200 00
		<hr/> \$5,000 00

Overhead Expenses—

6% on Capital invested	\$ 300 00
Depreciation on equipment, 10%	120 00
Rent and heat	300 00
Janitor service	60 00
Light, gas, power	20 00
Telephone	50 00
Laundry	30 00
Taxes	25 00
Sundry donations	50 00
Office assistant	350 00
Dental supplies and laboratory	750 00
Insurance—Sick, Accident, Fire Insurance (\$1,200) {	145 00
Life Insurance (\$3,800) }	
Salary—Savings for Investment	\$ 500 00
Wife	1,000 00
Self	1,000 00
	<hr/> 2,500 00
	<hr/> \$4,600 00

Hours in Office—

7 hours per day;
 5½ days per week—38½ hours;
 For 45 weeks (7 out)—1,732 hours.

Of this number not more than 60% of the hours are actual producing hours, or say approximately 1,000 hours.

The average hourly charge, therefore, in this case would be \$4.60, and it would be with this average in mind that this particular dentist should fix his fee.

It must be clearly understood that this average fee is merely a guide. Were it applied indiscriminately in every case, or for every hour, it would be just as illogical, just as unfair, and just as absurd as the old-fashioned system of charging a flat rate for certain operations (or should we say articles?)

This fee should be raised or lowered as conditions vary. The following factors should be considered:

- (a) Energy consumed (nervous patient or child);
- (b) Character of service, exceptional skill;
- (c) Speed of operator, amount accomplished;
- (d) Patient's ability to pay;
- (e) Cost of laboratory service.

Thus we have a logical and intelligent fixing of an average fee as a guide or standard, and a constant variation of that standard to meet the circumstances of each individual case.

How utterly unfair and unprofessional is the old plan of basing fees upon the number of fillings inserted, the number of crowns, or the number of teeth comprising a denture or bridge. One has only to compare an economic basis of fixing the dental fee with the older system to appreciate the financial, ethical and professional value of the more modern method.

Each dentist should prepare his own budget and thus arrive intelligently at the proper fee. The fixing of a minimum fee for the profession generally should be carefully avoided. A flat minimum charge would work an injustice to both patient and operator, and be of little advantage over past methods.

LABORATORY COST

In the foregoing budget laboratory service is included as a regular overhead expense, and in fixing the fee for any given period allowance must therefore be made according as there has been more or less laboratory service involved.

In many ways it is preferable to exclude laboratory service from the budget (which in the case cited would reduce the average hourly fee to a little less than four dollars) and then in each case add a sum sufficient to cover the laboratory charge. This method will be found particularly convenient for those who have their laboratory work done outside the office.

GROSS AND NET

Professional men frequently deceive themselves by thinking of the volume of practice in gross, rather than in net. Many dentists are

ever ready to tell what their gross practice is, but are significantly silent upon the matter of net. Let us remember that the important economic consideration is not that of gross receipts, but the net difference between receipts and expenditures.

The particular budget above referred to showed a relationship between gross receipts and net profit, as follows:

Total receipts	\$4,600 00
Expenses	2,100 00
	<hr/>
Net (salary)	\$2,500 00

That is to say, in every \$10.00 received, \$4.60 represented expense and \$5.40 profit, or in other words the cost of conducting the office was 46%. Statistics gathered from many different sources indicate that it actually costs an amount varying from 40% to 60% of gross receipts to conduct the average dental practice.

MAKING CONTRACT WITH PATIENT.

In all cases where dental service is being sought by a new patient, or where some special or extensive service is being rendered an old patient, it is advisable to decide upon an approximate fee for the completed case, and then have a clear understanding with the patient regarding the fee before commencing treatment. The following considerations are of value:

First,—Case should always be given adequate study before treatment is undertaken. In making this study one must take into account the patient's financial ability, and then the best possible treatment or restoration under the circumstances should be advocated. Complete study *does not* mean making an immediate diagnosis and rendering a snap judgment upon what may appear, at the moment, to be the most advisable method of procedure. Models of the case should be prepared and sufficient time taken in the interval between the first and second sittings to give adequate consideration to all of the questions involved.

Second,—A careful estimation of the service to be rendered and the approximate fee determined. In this connection one should consider the possible time and energy to be consumed, the skill required, and the amount of expense involved.

Third,—Making contract with the patient. Having decided upon the best service to be rendered under the conditions present, and the approximate cost of the same, the matter should then be presented to the patient in such a way as to secure the patient's attention, interest, desire to obtain, and finally, decision to have.

Always treat the patient's mouth as a single case. It is essential in the study of the case and in all discussions with the patient to treat the mouth as a whole, and not from the standpoint of a number of separate operations. Improper occlusion, faulty contact or imperfect dental restorations, previously inserted, should be corrected, and the

entire mouth left in a condition of health and as nearly normal as possible. If we believe what we teach and preach regarding oral hygiene, we do the patient an injury by leaving in the mouth faulty operations, imperfect occlusion or contacts, just because these conditions don't happen to be causing acute trouble.

So long as we charge for crowns, bridges, or fillings, the patient will place dentistry on much the same plane as the purchase of optical supplies or other merchandise. We must show the patient the relationship between normal restoration and the maintenance of a hygienic condition in the mouth, and further, the relationship between oral health and good general health. It is only as we educate the patient to the value of the service rendered that the patient will fully co-operate in the work, appreciate the dentist's efforts, and gladly pay a fair remuneration. Under such conditions the patient will not look upon the dentist as practising a refined form of robbery, but will rather look upon the dental operator as a real friend and benefactor.

Generally speaking, we must make health and appearance two strong points in our presentation of the case to the patient; health particularly in the case of men, and appearance in the case of women.

Don't talk mechanics, don't talk gold or porcelain. Such procedure is precisely akin to a surgeon discussing the kind of ligature he is to use in an operation. We should use the material indicated and the best of its kind in each case. We may take for granted that the patient has confidence in us and expects us to use as an adjunct to our personal service that material, be it gold, silver, or cement that will best accomplish the desired result. By discussing these matters in detail we but focus the attention of the patient upon materials used rather than upon the service rendered. This very thing, however, has been done so frequently that the public has come to look upon the materials used as more important than the skill demanded in their manipulation. In fact, dentists have been known to charge \$10.00 for a crown and throw in the treatment and filling of the root absolutely without charge. However, according to Dr. Gilmer, possibly in some of these cases the patient may have paid all the treatment was worth. The treatment of the roots of teeth has assumed a position of growing importance, and we must not only render better service in this regard, but secure an adequate fee. We must stop selling gold and capitalize our skill. Because gold is not used in the operation of prophylaxis, this, too, one of the most important procedures in dental practice, is either not charged for at all, or the fee fixed at a ridiculously low point.

TERMS OF PAYMENT.

Not only should we, under the conditions above indicated, discuss frankly with the patient the approximate fee, but also the terms of

payment. Make such a definite, decided arrangement that the question will not have to be re-introduced at a subsequent sitting.

Regularly, there should be a retainer fee of from 25% to 50% of the total contract and the balance upon completion of the work. Where a business man cannot meet these conditions he will gladly give promissory notes in convenient amounts, maturing at convenient dates, and covering the balance due. In most cases, however, where the patient cannot pay cash, the matter is best arranged by estimating the number of sittings to complete the work, and then have the patient pay a sufficient sum each sitting to make the completion of the operation and the completion of the payments approximately coincide. Where it is more convenient to the patient, a fixed weekly or monthly payment may be arranged. These arrangements having once been made, the office assistant will best be able to see that they are carried out.

Some dentists render accounts monthly and others upon the completion of the work. In every case it is advisable to have printed on the statement that accounts are due upon completion of operation. This makes the account overdue no matter when rendered.

COMPETENCE.

Every dentist should look forward to retiring after from twenty-five to thirty-five years of active practice, with sufficient capital set aside for a competence for his remaining years. The only way for a professional man to accomplish this is to deliberately plan to save a fixed sum each year and invest the amount in endowment or twenty pay life insurance, or in good securities, real estate or bonds. A man should save sufficient, that when the period of retirement arrives, his income will practically equal what he has been receiving from his practice. The following estimation is only approximate, but gives a fairly accurate idea of what the annual saving should be:

\$500 invested annually at 6% compound interest will	
amount in 35 years to	\$50,000 00
\$500 invested annually at 6% compound interest will	
amount in 30 years to	35,000 00
\$500 invested annually at 6% compound interest will	
amount in 25 years to	30,000 00

DENTAL STANDARDS.

The very foundation of successful dental practice is that the operator shall have in mind a clear picture of the normal, natural denture. The mouth should be studied from every standpoint, and the relationship of the surrounding parts kept clearly in mind. The importance of the dental arches, from the standpoint of facial expression, the nasal passages, the throat, speech, occlusion, oral cleanliness and general health should be carefully studied. This picture of

the normal, natural denture should be so clear to us that we are not only able to compare with the normal each case that presents, but are also able to convey this picture to the mind of the patient.

As the public more fully realizes that the practise of dentistry is the cure of disease and the practise of normal restoration, there will be markedly increased appreciation of the value of dental service.

The Growth of the Canadian Army Dental Corps.

CAPTAIN W. G. TRELFORD, TORONTO.

THE C.A.D.C., the "baby" organization of the Canadian Militia, although still in its infancy, is recognized to be indispensable. It has proved beyond contention its advantages as a separate unit.

The status of the army dental surgeon has advanced from honorary rank under the directorship of the A.M.C. to that of a distinct organization. Instead of honorary we now have substantive rank, we have staff representation, our own research officer, and our head is known as the D.G.D.S. (Director General of Dental Services).

In 1904 the first dental surgeon was appointed to the Canadian Militia. He held the rank of honorary lieutenant, and after five years' service was automatically ranked as honorary captain under the A.M.C.

In those days little was heard of the army dental surgeon; this episode will illustrate:

W. T. Hackett, the first dental surgeon appointed to the Canadian Militia, was stopped at Niagara Camp and asked what the "D.S." on his shoulder straps stood for. He promptly replied for "Distinguished Service, Sir," unconsciously speaking a great truth.

The only equipment allowed at that time was a head rest, which was attached to an ordinary chair; the small sum of \$10.00 was set aside for supplies and the officer furnished his own instruments; no attempt was made at prosthetic work. Later a small leather case was supplied, with a few instruments, including forceps, pliers and mouth mirror.

It was very apparent at this time the necessity of a unit administered by dental officers if the highest efficiency of the army was to be realized (already the Germans had recognized the need, and several military volumes of considerable size dealing with dentistry in the army had been issued).

In the early days of the war so many recruits were rejected as medically unfit on account of the oral condition existing that a big problem faced the military authorities.

The dentists were aiding in every way possible, both individually and collectively, and civilian clinics were established throughout

Canada. In Toronto alone there were six chairs in operation in the fall and winter of 1914 at Exhibition Camp, but these could not cope with the work, and there was the added problem of caring for the troops overseas.

In May, 1915, was born the C.A.D.C., under the leadership of Lt.-Col. Armstrong, and almost immediately fifty officers were appointed and sent overseas, accompanied by Col. Armstrong, to organize and carry out the services in England and France.

Up until August 11, 1915, no recruits were accepted who wore artificial dentures, partial or full; thus we were not allowed to practise dentistry in all its branches, and not until August 30 was the necessary authority forthcoming to proceed with the prosthetic end of the work, although there was an overwhelming demand.

The services of the C.A.D.C. extend from Halifax to Vancouver, cover England and France, and extend as far east as Egypt and Greece; in fact, so well known have the services become, and so high a standard has been maintained, that they have been commanded, and quite recently, by the Royal Family.

To secure an appointment with the C.A.D.C. an applicant must be a graduate of a Canadian college or a licentiate of a province of Canada. He must be approved by the O.C. of the C.A.D.C., as well as recommended by the G.O.C. of the Division in which he applies. This recommendation is then forwarded to Ottawa. On being appointed he is given the substantive rank of lieutenant, and on proceeding overseas is ranked as captain.

An officer is allowed an orderly, ranked as sergeant, who must be a qualified mechanical dentist, and a batman, ranked as a private.

Canada is divided for military purposes into thirteen divisions or districts, of which there are three in Ontario.

For Division No. 2, on June 16th, 1915, under the very able supervision of Capt. Guy G. Hume (then Lieut.) the first dental services were inaugurated at Niagara Camp, in the same building as was held the first Parliament of Upper Canada, under Lieutenant-Governor Simcoe in 1792—the old historic Navy Hall.

This camp quartered 10,000 troops, yet Capt. Hume was allowed the assistance of only one officer until July 10th, when authority was granted to employ an additional officer, and four civilian dentists (the latter were provided with transportation and subsistence).

The basis on which dental appointments are now made, is one officer for every thousand men recruited.

There are now in No. 2 Division some twenty-five chairs in operation, eleven of which are located at Toronto, ten at Exhibition Camp, and one at the Military Convalescent Home. All convalescents are cared for.

There are also clinics in operation at North Bay, Sault Ste. Marie, Owen Sound, Barrie, Orillia, Uxbridge, Oshawa, Brantford, Wel-

land, Brampton, Hamilton (three chairs), and arrangements have been practically completed for clinics at other places in this division. This arrangement is carried out in much the same way in other divisions throughout Canada.

The Toronto clinic is equipped with the latest type of electric dental engines, good chairs, fountain cuspidors, and other special equipment which tends toward efficiency. Much thanks is due General Logie, the G.O.C. 2nd Division, who, along with Capt. Hume, was instrumental in securing this fine equipment.

It might be interesting to note the volume of work accomplished in this division, which is comparatively small when you consider the scope of the C.A.D.C. This report is given up to the end of February:

Prophylaxis	460
Extractions	19,333
Treatments	6,285
Fillings	14,575
Finished cases	4,853
Dentures inserted	1,242
General anaesthetics	60
Emergency cases	2,076
Patients seen	12,782
Number of operations	43,205

Some restorations have been made in gold—in case of convalescents.

A new establishment, which has been drawn up by Major Clayton, Deputy D.G.D.S., of Militia Headquarters, Ottawa, proposed, and part of which is authorized, will be a great step forward in our ranking.

Dental Operations Performed by Officers of the Canadian Army Dental Corps in England and Overseas, July 15th to Dec. 31st, 1915.

Headquarters, C.A.D.C., 23 Earls Ave.,

Folkestone, February 15th, 1916.

Month.	Fillings.	Treats.	Dents.	Prophyl.	Extr.	Genl.	Total.
*July, 15 officers	5,516	575	110	111	1,210	979	8,621
August, 31 officers	5,875	797	109	499	4,212	100	11,592
September, 38 officers	7,119	1,307	816	1,534	4,804	1,008	17,588
October, 42 officers	9,890	1,302	1,250	1,000	4,402	1,100	21,944
November, 42 officers	10,719	2,451	1,200	1,000	4,000	1,500	24,870
December, 38 officers	8,807	1,000	1,000	700	1,200	1,000	24,507
Totals	41,347	8,209	3,325	4,705	11,716	4,604	104,506

*Dental clinics were not opened until the 15th July, with twelve

outfits, and eight more were received on the 22nd July, which gives an average of fifteen officers for the latter half of July.

†Reports have not yet been received from four officers.

Note.—The total number of operations is 101,474; the average number of dental officers for the five and one-half months is thirty-seven; the average number of operations performed each month by each officer is approximately 525.

On September 4th, 1915, the seven dental outfits used by the officers of the 4th, 5th and 6th Infantry Brigades, and the 4th Brigade, C.F.A., were delivered to headquarters, 2nd Canadian Division, for shipment overseas. They were not returned to the dental officers until September 27th. The only dental operations performed during this period by these officers were extractions and treatments.

J. ALEX. ARMSTRONG, Lt.-Colonel,
Director of Dental Services,
Canadian Contingents.

Canadian Dental Association.

THE 1916 meeting of the Canadian Dental Association will be held in Montreal, September 12th, 13th, 14th and 15th. This ought to be a great "get-together" convention, attended by dentists from coast to coast. Reserve the dates. Reduced railway fares. Full convention announcements later.

Ontario Dental Convention.

TORONTO, MAY 8TH, 9TH AND 10TH, 1916.

DR. ELMER S. BEST, Minneapolis, Minn., will give a paper on "Treatment and Filling of Root Canals"; other important features will be:

Treatment of Pyorrhea by General Practitioner.

How to Make a Diagnosis.

Use of Elevators in Exodontia.

Surgical Treatment of Apical Infection.

Cementation of Inlays, Crowns and Bridges.

Impression-taking.

Good clinics. Usual reduced railroad rates. Mark these dates now. Fuller announcement later. W. T. B. Amy, chairman.

Toronto Dental Society.

THE officers of the Toronto Dental Society: Past President, Dr. F. C. Husband; President, Dr. E. F. Arnold; First Vice-President, Dr. W. B. T. Amy; Second Vice-President, Dr. J. E. Rhind; Treasurer, Dr. W. T. Dawson; Secretary, Dr. R. D. Thornton; Auditors, Dr. E. C. Abbott and Dr. W. E. Willmott.

Letters to Oral Health from Members of the Canadian Army Dental Corps.

LIEUT.-COL. J. ALEX. ARMSTRONG.

Headquarters C.A.D.C., 23 Earls Ave.,

Folkstone, February 21, 1916.

To Dr. W. Seccombe,
269 College Street,
Toronto.

Dear Doctor Seccombe,—I wish to thank you for myself and on behalf of the Canadian Army Dental Corps overseas for your thoughtfulness in sending copies of ORAL HEALTH, which arrived a few days ago, and have been received with many expressions of appreciation.

The corps here is gradually winning its way to recognition and matters are shaping very well at present, though more officers are needed to carry on the volume of work presenting itself at all our clinics.

Our clinics and laboratories are the busiest to be found anywhere, and all are working with a will.

If Major Smith can find time I will have him send you a report of our work up to Dec. 31, also any other items of interest for your readers.

Sincerely yours,

J. ALEX. ARMSTRONG, Lt.-Col.,

Director of Dental Services.

* * * *

MAJOR A. A. SMITH.

Headquarters C.A.D.C., 23 Earls Ave.,

Folkstone, February 21, 1916.

Dr. W. Seccombe,

ORAL HEALTH.

Dear Sir,—I am taking the liberty of sending you a number of corrections for your Active Service Roll, as printed in your January number of ORAL HEALTH, and which I am sure you will be glad to have, as they are absolutely correct so far as the overseas list is concerned.

I believe there are a good many more on the list of officers on home service than appears in this number, but the names must be obtained from Ottawa.

I want to give you some idea of the work being done here, if the figures are available, before long, as I feel confident it will open your eyes. For instance, in the month of January alone, we turned out from St. Martins' Plains laboratory alone 563 dentures, or an average of 140 a week, and we have four laboratories working.

The operations in the clinics average about 40,000 a month, so you see the C.A.D.C. are not loafing on this end of the service.

We need more operators here badly, as there are none here but those who came over with me in December, and we have 50,000 troops scattered about, and more arriving every day.

Applications arrive every day or so for dental officers in hospitals or brigades, but we have reached our limit until reinforcements arrive.

Seven officers went to France in January, and we have had to shift our operators about to repair the vacancies and keep the clinics going at full speed.

Now I must not take any more of your time nor of my own, for I have not yet solved the problem of getting two things done in the time it takes for one, and consequently I am busy.

Sincerely yours,

A. A. SMITH, Major.

* * * *

CAPT. OLIVER LESLIE.

Hythe, England, February 20, 1916.

My Dear Doctor Seccombe,—Just a few lines to thank you for ORAL HEALTH, which you are so kindly remembering us with, and which I always enjoy. I think we devour the Canadian publications with a deeper appreciation and a keener interest than we were wont to do at home, due no doubt to the fact that here we are strangers in a land that is strange—if not sympathetically, at least geographically.

Since our landing in England last July the members of the Canadian Army Dental Corps have become widely scattered, many being absorbed by the various hospitals and camps in southern England; many in France, and a small minority between Salonika and Egypt.

My first six months I spent in charge of the dental clinic at Moore Barracks Hospital, Shorncliffe, where your townsman, Col. Scott, is officer commanding. Here we had a sick parade daily, averaging fifty men, and daily we turned out about ten artificial dentures along with our other dentistry. Some of the patients were from the hospital, some from local camps. In the case of soldiers from the front, presenting fractured jaws and shrapnel wounds of the face, the work was most interesting, as were also their vivid details of the fighting at Ypres and Festubert and Givenchy.

However, I was well pleased when, about three weeks ago, I received my appointment as dental officer to the First Pioneer Battalion, then in barracks at Hounslow, which is only a forty-minute run by tube from London. They tell me that as far back as Roman days this heath was used as a military camp. The barracks now standing were built during the Boer war. From the aerodrome, close by my hut, I watched many a flight of our aircraft as they circled over the Parke-Davis factory and disappeared into the blue.

We had barely gotten our clinic in good running order here when the battalion was ordered to Hythe for musketry practice, and are now in tents on Dibgate Plain. Fortunately for me, I am temporarily "carrying on" in my old quarters at Moore Barracks, where Captain Wright, of Calgary, is now in charge, and where I am trying to get all the plate work that my battalion requires completed before we cross to France, where I may be reduced to the exigencies of war: a tent for a clinic, possibly with corresponding inconveniences.

It was with deep regret and a sense of great personal loss that I learned of the death of my old classmate, Major Sale. I had the pleasure of dining with him at the mess at West Sandling when the 18th battalion were camped there last August, and many were the reminiscences we exchanged of our good old days at the R.C.D.S. together. He was just the same: high-spirited, jovial and extremely popular with everyone who knew him, as of old.

Hythe is a very interesting old town, one of the Cinque ports, and the eastern terminus of a canal built (as were also the Martello towers that dot the coast line from Dover to Hastings) to repel the expected invasion by Napoleon. At Hythe, too, is a famous school of musketry, where as many as seven hundred men may practise at once. The window in my billet looks out across the downs, where hundreds of fat Southdown sheep are grazing, and to the east are the hills and hazards of the Hythe golf links, where I had many a round with Major Perry Goldsmith before his return to Toronto in January. The links are most picturesquely situated, looking out over the restless channel, the red tile roofs of the little town huddled together towards the southwest, and westwardly the grey towers of Saltwood Castle, while on the east one glimpses various camps, the tents of Dibgate Plain and the huts of Moore and Napier barracks, with a northern horizon of rolling hills and blue sky. How very different will be the outlook next week when, with the First Pioneers, I am in the devastated country across the channel?

With very many thanks to you, I am,

Fraternally yours,

OLIVER LESLIE.

More Dentists Wanted at the Front.

DR. C. N. RUSSELL, professor of oral surgery at Temple University, who recently returned from the front, stated to a newspaper correspondent that 50 per cent. of the wounded soldiers require dental treatment, and consequently there is a great shortage of dentists.

"One poor fellow came into the American Hospital seriously wounded," said Professor Russell in citing a case which he stated was typical of many. "His entire lower jaw, with the exception of two fragments on each side, was shot away."

"The dentists, by attaching a mechanical device to his head, managed to hold the fragments of jaw in place, and the surgeons actually made a new jaw with plaster.

"Then the dentists replaced lost teeth and the soldier was again ready for duty.

"In trench fighting more than half the men are hit in the head, but owing to the shortage of dentists many of the men are compelled to wait a month for treatment. The French and Italians have realized the importance of the dentist, and have provided a dental corps for every field hospital."

College of Dental Surgeons of Quebec.

DONATION TO C. A. D. C.

FOLLOWING an address by Major Clayton at Montreal, the Board of Governors of the College of Dental Surgeons of the Province of Quebec donated \$250.00 to the Canadian Army Dental Corps. The following letter accompanied the donation:
Montreal, February 21, 1916.

Major Clayton,

Commander Canadian Army Dental Corps,
Ottawa.

Dear Sir,—I take great pleasure in sending you the enclosed cheque for two hundred and fifty dollars (\$250.00), subscription of the College of Dental Surgeons of the Province of Quebec towards the welfare of our boys at the front. It is desired that you should use your own judgment in the disposal of this money, as our Board of Governors hold the unanimous opinion that you are the right man at the right place, and are willing to back, to the ultimate limit, your valourous efforts to make the Dental Army Corps worthy of the cause they are fighting for, and the army they are working with.

Yours truly,
(Signed) JOSEPH NOLIN, D.D.S.,
President.

Commendation for Dental Services at University Base Hospital, Salonika, Greece.

IN a recent communication, Surgeon-General J. A. Roberts, in charge of the No. 4 University Base Hospital, referred to the dental officers as follows:

"This dental department of ours is an extremely important factor in our hospital work, and I simply do not know how to frame adequate words to convey my appreciation of the work done by Capt. Gow and Capt. Mallory. There has been no other dental department opened here so far, and these men have tried to carry on for all the British troops in this district. The number is well over 100,000,

and their clinic has been besieged from morning till night by men of every rank. The department is working so hard that I am just a little nervous for fear these men will play out, and have insisted that they take off at least a half day each week. The strain is certainly beginning to tell. I feel that under the circumstances we should have another dental surgeon with us, as practically every man coming into the hospital requires more or less dental treatment. The condition of the 'Tommies' mouths is simply bad beyond description. I am sure I do not exaggerate when I say that each man coming in requires the attention of a dental surgeon for from one to ten hours of his time. Even then the relief given would be only of the most temporary character."

Since the above was written, Capt. G. G. Hume, of Toronto, who performed such splendid service in efficiently organizing the dental service at Niagara Camp last summer, has been attached to No. 4 Base Hospital, and thus will soon be associated with Capt. Gow and Capt. Mallory in the excellent service which these men are rendering the Allies in Greece.

Acknowledgment.

DR. JOHN TEETZEL, OF BERMUDA.

DR. JOHN TEETZEL, Dental Surgeon, Bermuda, spent his usual three months' vacation, during the past summer, assisting Captain Hume at the dental clinic at Niagara Camp. The following letter indicates that Dr. Teetzel's action was appreciated, not only by the dental officers, but by the militia authorities as well:

MILITIA AND DEFENCE, CANADA.

Niagara Camp, 20th Sept., 1915.

Captain Hume,

Dental Clinic,

Niagara Camp.

Dear Captain Hume,—Will you be good enough to convey to Mr. John Teetzel the very deep sense of obligation which I feel for the very generous services which he rendered here during his vacation. It is just an example of that splendid service which so many dental surgeons are giving at the present crisis at great financial sacrifice to themselves.

I know that the Minister fully concurs in this expression of gratitude, and Mr. Teetzel may very well feel that he has done his bit in this great crisis.

Yours sincerely,

W. A. LOGIE,

Colonel,

O. C. 2nd Division.



Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army a dress is known.

HONOR ROLL

Major C. E. Sale, 18th Batt., 4th Brigade.

CANADIAN ARMY DENTAL CORPS

Overseas*

Lt.-Col. J. A. Armstrong.
Major O. K. Gibson.
Major A. A. Smith.
Capt. J. W. Bell.
Capt. C. Brown.
Capt. J. F. Blair.
Capt. G. N. Briggs.
Capt. W. J. Bentley.
Capt. G. S. Cameron.
Capt. O. A. Elliott.
Capt. E. A. Grant.
Capt. W. R. Greene.
Capt. George Gow.
Capt. O. G. Hassard.
Capt. J. E. Holmes.
Capt. G. G. Hume.
Capt. F. W. B. Kelly.
Capt. H. Lionais.
Capt. F. R. Mallory.
Capt. A. E. Mullin.
Capt. B. L. Neiley.
Capt. E. B. Sparkes.
Capt. G. H. A. Stevenson.
Capt. L. N. Trudeau.

†Major W. B. Clayton.

Capt. A. W. Winnett.
Capt. C. F. Walt.
Capt. J. E. Wright.
Lieut. H. F. Alford.
Lieut. G. Atkinson.
Lieut. R. H. Atkey.
Lieut. W. A. Burns.
Lieut. C. H. Bray.
Lieut. G. W. Bray.
Lieut. H. Clarke.
Lieut. A. R. Currie.
Lieut. G. H. Fowler.
Lieut. A. A. Garfat.
Lieut. W. H. Gilroy.
Lieut. D. H. Hammell.
Lieut. J. W. Hagey.
Lieut. H. C. Hodgson.
Lieut. E. W. Honsinger.
Lieut. E. C. Hutchison.
Lieut. R. Jamieson.
Lieut. J. L. Kappeler.
Lieut. E. J. Kelly.
Lieut. O. Leslie.
Lieut. A. G. Lough.
Lieut. C. A. McBride.
Lieut. W. G. MacNevin.

Lieut. C. E. McLaughlin.
Lieut. R. McMeekin.
Lieut. B. P. McNally.
Lieut. E. McNeill.
Lieut. H. C. Macdonald.
Lieut. J. W. Macdonald.
Lieut. E. D. Madden.
Lieut. V. C. W. Marshall.
Lieut. L. L. Matchett.
Lieut. G. V. Morton.
Lieut. J. F. Morrison.
Lieut. J. B. Morison.
Lieut. C. H. Moore.
Lieut. P. E. Picotte.
Lieut. H. Ross.
Lieut. J. Roy.
Lieut. W. A. Sangster.
Lieut. J. F. Shute.
Lieut. D. P. Stratton.
Lieut. R. C. H. Staples.
Lieut. E. S. Tait.
Lieut. L. A. Thornton.
Lieut. H. P. Thompson.
Lieut. H. P. Travers.
Lieut. D. D. Wilson.
Lieut. Karl F. Woodbury.

Concentration Camps

Capt. G. C. Bonnycastle.
Capt. F. H. Bradley.
Capt. C. D. DesBrisay.
Capt. D. M. Foster.
Capt. W. Y. Hayden.
Capt. Jas. M. Magee.
Capt. H. L. Mitchener.
Capt. S. H. Simpson.
Lieut. J. T. Adams.
Lieut. S. G. Alderson.

Lieut. N. S. Bailey.
Lieut. D. J. Bagshaw.
Lieut. J. A. Beatty.
Lieut. F. C. Briggs.
Lieut. T. W. Caldwell.
Lieut. C. E. Campbell.
Lieut. E. H. Campbell.
Lieut. A. V. Cashman.
Lieut. E. H. Crawford.
Lieut. Karl Damon.

Lieut. J. M. Deans.
Lieut. R. L. Dudley.
Lieut. J. H. Duff.
Lieut. J. N. Dunning.
Lieut. W. R. Eaman.
Lieut. R. W. Fell.
Lieut. H. B. Findley.
Lieut. R. W. Frank.
Lieut. J. P. Gallagher.

†Acting Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—Care Director Dental Services, Canadian Contingents, 23 Earls Ave., Folkestone, England.



Concentration Camps.—(Continued.)

Lieut. G. E. Gillman.
Lieut. J. S. Girvin.
Lieut. W. T. Hackett.
Lieut. H. J. Henderson.
Lieut. P. J. Healey.
Lieut. F. Hinds.
Lieut. R. O. Howie.
Lieut. G. H. Hollingshead.
Lieut. H. C. Jeffrey.
Lieut. C. M. Joyce.
Lieut. Frank Knight.
Lieut. L. Lemire.
Lieut. T. H. Levey.
Lieut. C. C. MacLachlan.
Lieut. H. C. Mann.
Lieut. D. W. Massey.

Lieut. W. J. McEwen.
Lieut. E. F. McGregor.
Lieut. D. K. McInish.
Lieut. W. S. McLaren.
Lieut. W. H. McLaren.
Lieut. L. D. McLaurin.
Lieut. G. A. Munroe.
Lieut. Otto Nass.
Lieut. H. A. Nesbitt.
Lieut. J. G. O'Neill.
Lieut. R. M. Peacock.
Lieut. F. H. Quinn.
Lieut. W. H. Reid.
Lieut. J. W. Reynolds.
Lieut. T. E. R. Rodina.
Lieut. J. A. Ross.

Lieut. W. J. Rutherford.
Lieut. H. A. Rutherford.
Lieut. J. A. Rutherford.
Lieut. J. A. Thomas.
Lieut. E. L. Thompson.
Lieut. H. L. Thompson.
Lieut. V. H. Wrentham.
Lieut. G. A. Wrentham.
Lieut. F. H. Williams.
Lieut. F. M. Williams.
Lieut. F. M. Williams.
Lieut. J. H. Wilson.
Lieut. J. H. Wilson.
Sgt. H. G. Derry.
Sgt. H. G. Derry.
Sgt. J. H. Derry.
Sgt. W. J. Taylor.

Divisional Officers

Capt. T. C. Bruce.
Capt. A. Dubord.
Capt. H. T. Minogue.
Capt. F. P. Shaw.

Capt. W. G. Treford.
Capt. Geo. K. Thurman.
Capt. W. G. Thompson.

Capt. F. M. Walls.
Capt. J. M. Wilson.
Capt. W. M. Wright.

ATTACHED TO CORPS OTHER THAN C.A.D.C.

Overseas

Major P. P. Ballachey, 58th Batt.
Major G. S. Cameron, 9th C.M.R.
Major F. T. Coghlan, 25th Battery.
Capt. K. C. Campbell, 43rd Batt.
Capt. Chas. A. Corrigan, Army Service Corps.
Capt. J. R. Duff, 79th Batt.
Capt. J. Harper, Royal Navy.

Capt. J. L. McLean, 10th Batt.
Capt. Walter McNally, 17th Batt.
Capt. H. J. Rutherford, 47th Batt.
Lieut. A. E. Taylor, 10th Batt.
Lieut. H. J. McLaurin, 43rd Batt.
Staff Sgt. J. L. Roberts, C.A.M.C.
Pvt. K. P. Marshall, Transport Corps.

Concentration Camps

Lieut. Col. H. F. Armstrong, 159th Batt.
Lieut.-Col. H. A. Croll, 10th C.M.R.
Lieut.-Col. Nell Smith, 189th Batt.

Major N. Roberts, 10th Batt.
Capt. A. L. Johnson, 10th Batt.
Lieut. C. Nicholson, 10th Batt.
Lieut. C. E. Whelan, 10th Batt.

UNDERGRADUATES

Overseas

F. H. Barry, C.A.D.C.
A. Chambers, C.A.D.C.
E. R. Dixon, 71st Batt.
J. E. Dore, C.A.D.C.
E. Garfat, 71st Batt.
J. E. Irwin, C.A.D.C.
J. T. Irwin, 4th U.C.T.C.

A. W. Jones, C.A.D.C.
J. V. Lally, C.A.D.C.
J. G. Larmour, C.F.A.
H. B. Leggett, C.A.D.C.
W. C. Lacey, C.A.D.C.
E. R. McEwen, C.A.D.C.
C. F. McCartney, C.A.D.C.

E. H. McGuire, C.A.D.C.
E. Y. McGuire, C.A.D.C.
T. E. Walker, C.F.A.
A. Walker, C.A.M.C.
E. Walker, C.A.M.C.
E. H. Wong, C.A.D.C.

Concentration Camps

Lieut. R. M. Barbour, 64th Batt.
H. G. Bean, 189th Batt.
R. Bishop, C.A.D.C.
A. E. Chagwin, 189th Batt.
F. Cluff, 161st Batt.
E. N. Elliott, C.A.D.C.
H. Greenwood, 76th Batt.
G. M. Helms, Div. Sig. Corps.
G. W. Howson, 126th Batt.
T. H. Hutchinson, C.A.D.C.
J. T. Irwin, 4th U.C.
G. G. Jewitt, Field Amb.
A. N. Laidlaw, Mach. Gun.

E. J. McKee, C.A.D.C.
J. M. McLeod, Div. Sig. Corps.
G. R. McLeod, Army Transport.
A. L. Norton, C.A.D.C.
C. V. Parker, C.A.D.C.
A. H. Pook, C.A.D.C.
E. A. Pook, C.A.M.C.
E. J. Roberts, C.A.M.C.
G. A. Ross, Army Transport.
G. H. Ross, 10th Batt.
Sgt. H. Ross, 10th Batt.
Sgt. L. Ross, Div. Sig. Corps.
F. C. Thompson, C.A.D.C.

ORAL HEALTH

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Vol. VI.

TORONTO, MARCH, 1916

No. 3

EDITORIAL

A Canadian Department of Health.

DR. STEELE, M.P., North Oxford, Ont., introduced a resolution in the Canadian House of Commons recently expressing the greater need at the present time for a national department of health than at any previous time in the history of the Dominion. He pointed out that while all Provincial Governments maintained well organized health boards, the Dominion had the control of many matters relating to the health of the people distributed over eight or ten departments of the Government. Practically every European nation, with one or two small exceptions, has organized national health departments, but Canada lags behind. He spoke of the progress made in the United States toward a department of health; also in Japan. There was urgent need for such a department in Canada, as at the close of the war there would in all probability be a greater influx of immigrants than ever before in the history of the country. He believed that 40 per cent. of the babies dying in Canada every year could be saved. It was promised by the Government that the matter should receive due consideration.

New Establishment.

CANADIAN ARMY DENTAL CORPS.

THE Canadian Army Dental Corps, though organized since the commencement of the war, has amply justified itself by the large measure of useful service already accomplished. The corps, having been established as a separate unit, occasioned a complete readjustment of the dental services in the Canadian Militia. *Status quo*, that arch enemy of progress, was of necessity somewhat disturbed, resulting in a lack of co-operation in certain directions, amounting almost, in some cases, to active opposition. Unfortunately, the Dental Corps has received the least help in a quarter where it naturally might expect the greatest encouragement and assistance.

This lack of co-operation in France has been particularly unfortunate, and has resulted in soldiers being sent to England for dental services (or in their being deprived of those services altogether) that might, under other circumstances, have been readily supplied in France. An army officer who deliberately stands between the soldier in the trench suffering what Burns has called "the Hell of all diseases," and the dental surgeon who is ready and anxious to give relief and comfort, is unworthy of respect or confidence. Standing upon prerogatives, erecting barriers of regulations, weaving entanglements of red tape, impeding the work and attempting to retard the development of the Canadian Army Dental Corps Overseas, is nothing less than "disgraceful conduct in a professional respect," and yet that is precisely what seems to have occurred "Somewhere in France."

Opposition of such a character will ultimately result in advantage to the dental corps. Strength and *esprit de corps* will be developed and a more solid foundation laid upon which to build the superstructure of the C.A.D.C. than would otherwise be possible. It is only as difficulties are met and overcome that the strongest and best qualities are developed. This new corps will, we believe, not only "win its spurs," but earn the esteem and confidence of the entire militia because of its devotion to duty, the efficiency of its work, and the important service it will render.

* * * *

Elsewhere in this issue will be found an article, written by Capt. Trelford, outlining the early organization of the C.A.D.C., and a report on the work recently accomplished at the Toronto Camp. We also publish a report on the dental work accomplished by the C.A.D.C. in England and Overseas from July 15th to December 31st, 1915.

* * * *

The C.A.D.C. has already outgrown its original establishment. The tremendous demands that have been made upon the corps, and

the growing need for dental services in the militia, have occasioned a new establishment that the situation might be adequately met. Major Clayton having spent six months overseas, returned to Ottawa with practical knowledge of the needs of the corps, and was invited to draft a new establishment that would make the dental corps more efficient and better able to bear the extensive burdens that have been placed upon it.

Major Clayton has rendered most excellent service in securing, under this new overseas establishment, greatly improved standing for the C.A.D.C., and the elimination of many disabilities under which army dental surgeons have been compelled heretofore to do their work.

Militia orders covering this new establishment are as follows:

**MILITIA ORDER No. 80.—CANADIAN EXPEDITIONARY FORCE—
ESTABLISHMENT—CANADIAN ARMY DENTAL CORPS
—AMENDMENTS.**

With reference to Militia Order 257, 1915, the following amendments are authorized:

HEADQUARTERS STAFF.	Officers	W.O.'s	Q.M.S.'s	Orderlies	Bat- men	Total Personnel	Horses
D.D.G.D.S.	1	..	..	1	1	3	1
Adjutant	1	..	..	..	1	2	1
Research Officer	1	..	..	..	1	2	1
Dental Officers at Headquarters, London	2	..	..	2	2	6	..
Quartermasters	1	..	..	..	1	2	1
Assistant Quartermasters	1	..	..	..	1	2	1
Sergeant-Major .....	..	1	..	..	..	1	..
Quartermaster-Sergeant .....	..	..	1	..	..	1	..
Assistant Quartermaster-Sergeant ..	..	..	1	..	..	1	..
Clerks .....	..	..	..	3	..	3	..
Total	7	1	2	6	7	23	5
At Corps Headquarters.							
Each Infantry Brigade							
..... 4 Dental Surgeons (3)	12	..	..	12	12	36	..
Total	7	1	2	6	7	23	5
At Corps Headquarters.							
For Services Corps troops							
..... 2 Dental Surgeons ..	2	..	..	2	2	6	2
Total	2	..	..	2	2	6	2
A.D.D.S.	1	..	..	1	1	3	1
D.A.D.D.S.	1	..	..	1	1	3	1
Each Infantry Brigade							
..... 4 Dental Surgeons (3)	12	..	..	12	12	36	..
Each Artillery Brigade and A.C. 1 Dental Surgeon (4)	4	..	..	4	4	12	4
Each Field Ambulance							
..... 1 Dental Surgeon (3)	3	..	..	3	3	9	4
Each Stationary Hospital							
..... 1 Dental Surgeon (2)	2	..	..	2	2	6	..
Each General Hospital							
..... 2 Dental Surgeons (2)	4	..	..	4	4	12	..
Each Base Stores							
..... 1 Dental Surgeon	1	..	..	1	1	3	..
Each Advance Stores							
..... 1 Dental Surgeon	1	..	..	1	1	3	..
Each Casualty Clearing Station..							
..... 1 Dental Surgeon	1	..	..	1	1	3	..
For remaining units of Division..							
..... 2 Dental Surgeons ..	2	..	..	2	2	6	..
Total	32	..	..	32	32	96	10

RANK OF OFFICERS OF CANADIAN ARMY DENTAL CORPS (OVERSEAS).

The Deputy Director General Dental Services to be Lt.-Colonel.
Senior officer with each Division—Lt. Colonel and one Major.
Research Officer to have rank of Major.

Remainder of overseas officers, other than Honorary rank, to have rank and pay of Captain.

Orderlies to be Mechanical Dentists, and to have rank of Sergeant.
Batmen to be Privates.

Note.—The figures in parenthesis denote the number of Delegation, etc., for a Division.

CANADIAN ARMY DENTAL CORPS—OVERSEAS.

SHOWING INCREASE IN PROPOSED NEW ESTABLISHMENT.

Present Establishment.	Proposed Establishment.
Staff.	Staff.
	Lt.-Colonels 4
	Majors 1
	Other Officers 1
	N.C.O.'s and men 24
Total NIL	Total 29

COMPARATIVE STRENGTH PER DIVISION.

Majors 1	Lt.-Colonels 4
Captains 18	Majors 1
N.C.O.'s and men 28	Captains 10
Total 47	N.C.O.'s and men 24
	Total 34

Increase per Division.

Lt.-Colonels 1
Captains 11
Total Officers 12
N.C.O.'s 11
Men 13
Total N.C.O.'s and men 24
Total Increase Officers, N.C.O.'s and Men per Division 36
Total 36

CANADIAN ARMY DENTAL CORPS—HOME SERVICE.

	Officers.	Delegation	Batmen	Proposed Home Service.
D.G.D.S. and Assistant, Headquarters, Ottawa 2	2	2	2	1
1st Division 8	8	8	8	1
2nd Division 11	11	11	11	1
3rd Division 12	12	12	12	1
4th Division 8	8	8	8	1
5th Division 4	4	4	4	1
6th Division 11	11	11	11	1
No. 10 Military District 10	10	10	10	1
No. 11 Military District 10	10	10	10	1
No. 13 Military District 12	12	12	12	1
One Quartermaster for each Division and District 9	9	—	—	14
Total 111	115	501	501	9

No doubt the establishment for Home Service is only suggestive, as already more dental officers than the number indicated are at work in certain divisions, and many more will require to be added to meet the demands of the several corps.

It will be noted that this new establishment provides for a research department for the accumulation of statistics and the study of problems peculiar to war conditions. The complete change of diet of an army in the field, for instance, or occasionally, the complete absence of water, and the relationship of these problems to dental disease and treatment are worthy of special study.

Lieut. McLaurin Wounded.

WORD has been received that Lieut. H. J. McLaurin, 43rd Battalion, Winnipeg, has been wounded. We are glad to report that Lieut. McLaurin's wound is not reported as being serious.

Casualty—C.A.D.C.

THE following message was received at C.A.D.C. Headquarters from Captain E. C. Hutchison, "Somewhere in France":

To the O. C. Canadian Army Dental Corps, Shorncliffe:

Regret to report Sgt. N. W. Snape badly injured by shell fire. He has been sent to the rear. At the present moment I can't tell you just where he is. I think he will probably be sent to England.

It happened about one o'clock on Tuesday, Feb. 15.

Dr. Cummer's Complete Article.

ORAL HEALTH is to publish Dr. Cummer's complete article on "Partial Dentures," commencing this issue, and continuing in the April and May numbers. The manuscript is abundantly illustrated, there being no less than one hundred and sixteen illustrations in the series. There will, no doubt, be an unusual demand for these issues of ORAL HEALTH, and subscribers are urged to preserve them, that the complete article may be available for study and future reference.

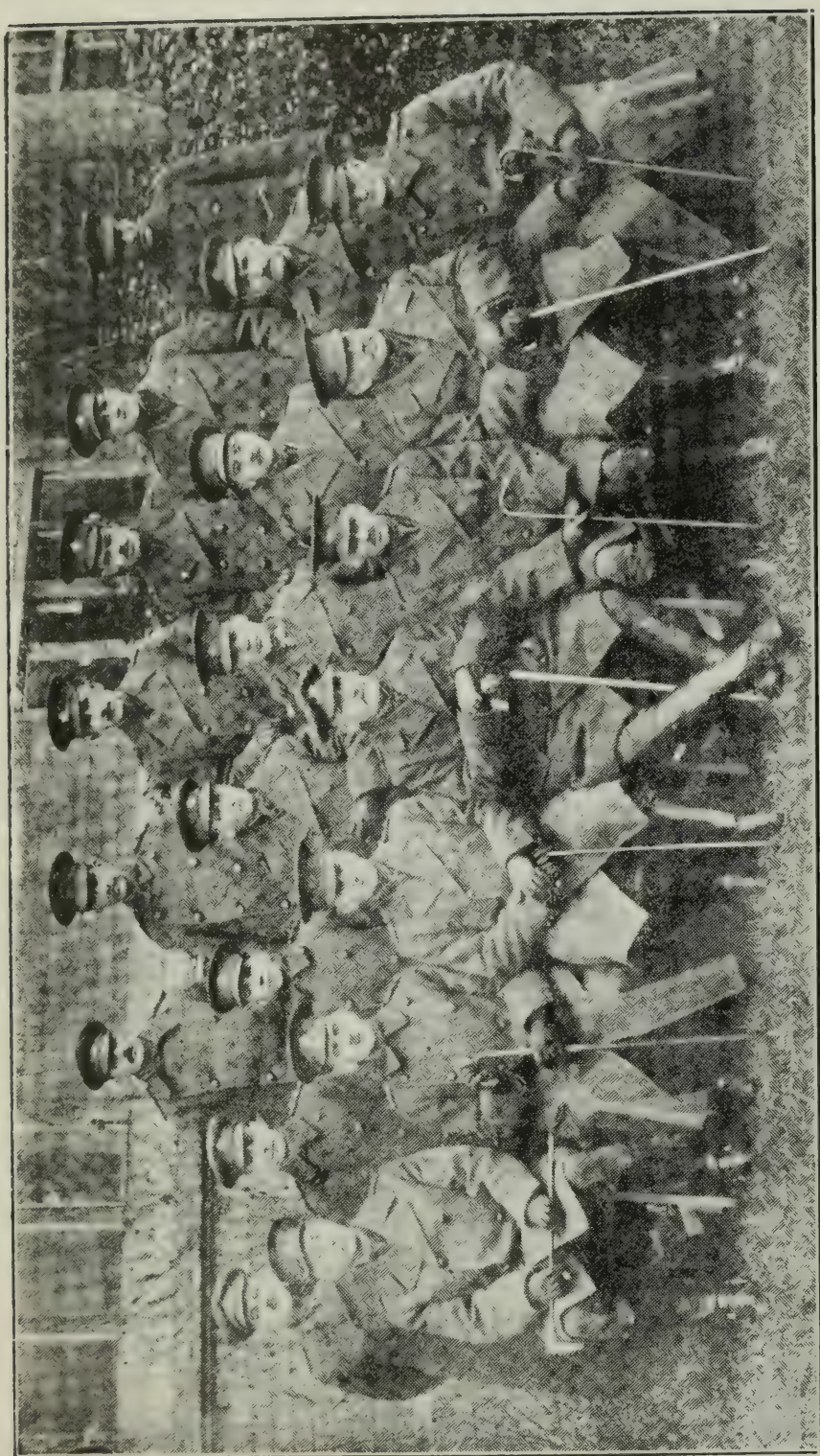
Major Clayton on Western Tour.

MAJOR W. B. CLAYTON, Acting Director of Dental Services, Canadian Army Dental Corps, addressed a meeting of Winnipeg dentists and their friends on the evening of March 14th, and on the following Thursday spoke before the Canadian Club of Calgary at their noon luncheon, and during the same evening addressed the members of the Calgary Dental Society.

Artificial Dental Exercise

THE constant chewing of gum overtaxes the salivary glands to such a degree that there is little response to the normal stimulus of food, resulting in quantities of other liquids being swallowed during a meal in an attempt to supply the loss. The irritation to the stomach occasioned by the abnormal flow of saliva between meals, and the displacement of saliva by other fluids during meals, cause those digestive disturbances which usually accompany this objectionable habit. Exercise the teeth by all means, but exercise them as Mother Nature intended by the mastication of properly selected food, and not by an artificial method such as the chewing of gum.





A GROUP OF OFFICERS OF THE CANADIAN ARMY DENTAL CORPS.

Sitting (left to right)—Captains J. W. Bell, J. F. Morrison, J. E. Holmes (Adjlt.), Lieut.-Col. J. A. Armstrong, C.O.; Major A. A. Smith, Captains W. A. Burns and J. E. Wright. Middle row—Captains A. W. Winnett, G. H. Bray, E. J. Kelly, V. C. W. Marshall, P. B. McNally, R. C. H. Staples, C. F. Walt. Back row—Captains J. F. Shute, E. McNeil, E. D. Madden, E. A. Grant, E. S. Tait, S. C. Macdonald.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, APRIL, 1916

No. 4

Buffalo Letter

BY HABEC.

BLIND FAITH! AN ILLUSTRATION

HABEC has appeared before the readers of ORAL HEALTH in a variety of roles illustrating the vagaries of his mental idiosyncrasy, but his last one literally dumped him from the frying-pan into the fire. It was all on account of the mongrel rhyme that proved a lemon instead of a lime, but meant in good part by simple Habec to show Dr. Leumen Waugh the proper respect. A letter from one of Habec's good friends says that he took a year's chance on ORAL HEALTH to read what "Habec had to say to the dental world," and the mongrel rhyme is what he drew in the first number. Whether it be a loyal sacrifice on the altar of friendship, or an impermissible instinct of the gambler that precipitated such foolhardy extravagance, Habec wots not, but he, nevertheless, is much gratified at the trust reposed in him.

In view of the foregoing illumination, Habec has decided to come out into the open and declare himself willing to qualify in the amateur class, ready to meet all comers of his weight. Just this once, please, dear reader; he promises never to do it again. We know it's a despicable way to use old friends, but he feels another "game" working inside spoiling to get out, so here comes the test of your friendship. We implore you to remain neutral.

* * * *

The following lines are dedicated to the boys of our profession.

who have so nobly responded to their country's call, and of whom we are proud because of their great sacrifice and splendid service. The dentists of Canada rallied almost to a man to the spirit of service peculiar to their calling, by restoring the teeth of the otherwise unfit. Thousands of good soldiers have been recruited in this way, and an added honor and significance given to one of the greatest of all professions. Whatever may be the issue of this terrible conflict, or the final relations of the Union Jack and the Stars and Stripes, the ranks of the dental profession under both emblems shall become more closely cemented through the common bonds of their profession's righteousness:

THE DENTIST'S REVEILLE.

In quiet ville, in busy mart,
At seaport town, through country's heart,
Across the plain, o'er mountain top
The wave rolls on; it cannot stop.
The bugle blast, so loud and long,
Calls to the weak, inspires the strong:
It chills the heart of faithful wife
And speeds the husband to the strife.
It sends the dread to mother's heart,
Father and son are forced to part;
Perhaps to meet 'mid cannon's roar,
Or yet, mayhap, to meet no more.

A privilege her son's may pray
To serve beloved Canada,
To buckle on the armor grand,
To fight for their own fatherland,
And paint on history's glowing page
The sign that will to every age
Tell of glorious victories won
And valiant deeds so nobly done.

And when the final score is made,
That awful debt is fully paid,
No men of all the fearful toll
Have given more of life and soul
To Him in gratitude and thanks
Than those recruited from *our* ranks.
Wherever duty bade them go,
E'en to the lines of sturdy foe,
No yellow streaks were ever seen,
No weak backbone or chicken spleen
To dim the lustre glorified
By love and duty sanctified.

"My country 'tis of thee,
 Sweet land of liberty,"
 This life to thee I give,
 Nor would I wish to live
 To hold from thee that service due
 From thine own son whose heart beats true,
 And when at last 'tis cold and still,
 Soft comes an echo, the dentist's reville.

* * * *

We may as well put in another one so that you will be satisfied
 and never want any more from this source:

'MEMBER TH' TIME?

Down where the sparrer has her nest,
 Jest up over the bull-frog pool,
 Hid by moss on an old dead snag,
 And shaded by a big toadstool,
 Jest north by east a foot or two
 Is the purtiest hump I know
 Fer a feller to sit or lay an' snooze
 An' fergit thet he'd orter go.

It's jest as round as a Northern Spy
 An' green with softest grass,
 All padded like the parlor chair
 An' smooth as apple sass.
 Gee Whiz! but that's some fishin' spot
 Right immegially after rain,
 An' if y' miss it after this
 Y've got yerself to blame.

You git yer can of nice fat worms
 An' 'bout a rod o' line
 An' have a good live saplin' pole,
 By hick'ry, y'll have some time
 Jest figger that a milkin' pail
 Is 'bout the proper size,
 An' if yer wishbone's any good
 Y'll fill it 'fore y' rise.

Them bullheads must be plain dumb fools
 The way they grab an' bite;
 They act as if they couldn't wait
 But jest go right in an' fight
 To git thet little piece of worm
 Away from all the rest,
 As if they want a whole can full
 An' more, too, I'll be blest.

Sech fun as that don't come along
 On every blessed day,
 But jest on extry specials, like
 When nothin's in the way.
 And then agin some times y'll fish
 Y're goldurned head most off,
 But seems them pestiky bull-pouts
 Jest stand an' grin an' scoff,
 Like old Hy Sutch does when he gits
 His airy feelin's on
 Jest 'cause he leads the G. A. R.
 An' bangs th' old bass drum.

But you jest stick around awhile
 Until old Sol goes down,
 Then drop a nice fat wiggly worm,
 An' don't y' make a soun'.
 Be sure it lands outside the root
 Next to the rotten tree,
 An' if y' don't git two at onct
 Jest take it out of me.

An' then jest as its gettin' dusk
 Y' peel off all y'r togs,
 An' dive off from the crossin' plank
 Between the old oak logs.
 A splash, a swim, a dive agin,
 Oh. Gee, how cool y' be!
 Them pesky chores is easy now
 Y' feel so light an' free.

* * * *

OSTENSIBLE INTEGRITY. .

That sounds a little like some new attachment for an automobile or a freshly discovered organism, but the dictionary tells us that in reality it's a sort of fake honesty sometimes made use of by certain dentists who are indigenous to various parts of the U.S.A., Canada and the rest of the civilized world. No mention of Mars, Porcupine or Chicago is made. But if you can define the confines of your "professional character" and get a good radiograph of it, perhaps you might find numerous rarefied areas indicating the presence of "ostensible integrity"; and again, you might not. But in case you did we would give you the benefit of the doubt and dissect away the "ostensible," and label your moral ingredients non-poisonous and chemically pure. How many of us use ostensible integrity as a general filling material? We may place a beautiful gold inlay, but the cavity may be lined with O. I., and when it comes to root canal treatment and filling, why, it has become a standard preparation.

Owing to the fact that it can be used in unlimited forms and combinations, the possibility of its universal application renders it an insidious and shifty commodity to traffic with. At first, our patients don't suspect us of using it, but when they find out, it's all off with Uncle Dudley, and nothing you may do will set you right with them again.

The canaliculi and the deep cells of the jaws of the civilized peoples of the earth are veritable catacombs, filled with myriads of the dead and slumbering issues of "ostensible integrity." For decades at a stretch they may hide your secret and preserve your reputation until, on some fateful day, the gay and festive streptococcus veridens drops in for a social call, awakening the slumbering ones, who in turn attempt to throw out the dead ones—and the scrap is on. With strepto sicing them on, the war dance is started, and with javelins and battle axes they lay siege to the walls of the citadel, jabbing their way through the battlements, and with a last supreme effort, burst forth in fetid, putrid hordes into an otherwise sweet and pure vacuum chamber which was the pride and joy of some fastidious peaches and cream package of dimples heretofore uncontaminated by sordid filth.

This is one of the situations we are creating every day by way of glorifying our noble calling. When, instead of working its way out, the explosion backfires and throws untold millions of these nomadic militants into the blood stream, they may find lodgment anywhere between the bump of self-esteem and the big toe. According to the various crews of bug hunters, dire results follow a visitation of these health pirates, and one authority avers that more than one hundred thousand persons are required to pay this annual toll. Our own Leumen Waugh raises the ante four times on the other fellow, which seems rather an extravagant statement; however, not being able to interview any of the departed at this time, we will have to take these statements for their face value.

Perhaps, for our own peace of mind, we might split the difference, but even so, the figures are appalling and put a decided crimp in the ingrown sense of appreciation of the superior ability which we have always known ourselves to possess. Why should we feel it necessary to agree with those who do not coincide with us? Not only are we satisfied with our own intellectual supremacy, but we admit it; so why should we be disturbed by scientific investigators. However, let us divorce the two words at the head of this item and take the latter one for better or worse, never to part. It is *honesty* of all the virtues, and will preserve harmony among the others which we may be fortunate enough to possess. It will help them grow and will be found the most useful part of your office equipment. Haber, however, has found his radiograph to be completely honeycombed with ostensible integrity, and to avoid creating the impression that he is in a position to preach, he owns up to being so far from the

ideal in this respect that he presents himself to you as the horrible example rather than the one to pattern after.

APPENDIX-ITIS.

Habec has thought long and seriously on the utter profligacy of the great Wilhelm with the lives of his soldiers, and has come to the conclusion that he has an eye for the war game in the next world. The greater number of the faithful he can transfer to Beulahland, the greater the army that will be awaiting his arrival to escort him to the goal of his ambition. But suppose Saint Peter should point "thumbs down"? What a joke on the Emp. that would be.

February 18-19 last we had the annual alumni meeting of the dental department of the U. of B. About four hundred of the faithful dug up the annual dues, which shows that the boys pull a tooth now and again. Occasionally we meet with one who exhibits real affluence for which they are oftentimes duly sorry. For instance, Abram Hoffman, the genial, has been sporting a handsome twenty-four carat fur-lined overcoat, which was the pride of the family. During the festivities he deposited it in a conspicuous and supposedly safe place. It is still safe from his possession with every prospect of a continuance of the same. Habec's coat laid beside it, but evidently the exponent of annexation was a person of refined and fastidious tastes and not a collector of antiques. Moral: If your coat isn't worth checking for ten cents, it will be safe even at prayer meeting. Sorry the cold weather continues, Abe.

We were favored by the presence of several good fellows from out-of-town. First in order of their appearance came Elmer Best, of Minneapolis. At the very start he showed that he was the superlative of good, both in name and in the exemplification of the subject of root canal treatment and filling. He thoroughly convinced Habec that the Best way really is the best way, and as a delver into sub-maxillary intricacies we are ready to back him on general results. Of course we disagree with him in lots of ways; however, his word is as good as ours. Dr. Best is a young man who may yet wear the gold and purple of our fraternity as well as to carry the cross. A field of righteous endeavor and thanklessness is before him.

Only a few isolated dentists are living who have not heard of, or do not know, Donald Mackay Gallie, who resides on the fringe of Lake Michigan, and is the last man to be shunted from the presidency of the N.D.A. He did some good team work with himself at the Alumni Association banquet during the meeting, and everybody was delighted with the way he shot the gentleman cow and got away with the remains. Dr. Gallie is surcharged with the essence of good humor and is glad to be alive to give each new year the glad hand. He's a twenty-four and three-fourth's parsnip scintillator, all wool and almost a yard wide in places. We were trebly glad to have him in our midst for a day, and hope he will try us on again.

Joseph Head, who has for several decades past brushed his teeth in Philadelphia, journeyed to Buffalo just to tell us about it and show how famous a little thing can make a big man. He is right about it all, and we are strong for him because he is sensible, practical, sincere and honest. If we should say all we would like to about him he would have nothing left to put in his new book, so we will steal no more of his thunder. Buy the book and read what we would say if we had space, and bear in mind that Dr. Head has done more for the cause of pyorrhea (your pardon, Dr. Head, we should have said mouth infection) than all but a select few. It was a case of getting in Head-first.

Habec cannot mention the clinics except that of Toronto's own Ernest Cummer. He showed some splendid work in connection with partial dentures, and excited a great deal of interest in and admiration of his system, which was replete with novel and original ideas. He is on the right track without doubt, and will do much to solve the means of correctly placing partial pieces. Over on Woodhys's side he is looked upon as one of the few greatest prosthodontists of the present time. Ernest Cummer is a most appropriate name, for he exemplifies the first one and surely is all that the surname implies. We could say much more about him, but we don't want him to get chesty. Under so able a chaperone as Dr. Clappison, of Hamilton, Dr. Cummer behaved very creditably while in Buffalo.

Glycerin as an Antiseptic

WHILE glycerin has long been regarded as possessing some degree of antiseptic power, it is quite recently that it has been proved to be a most admirable sterilizing agent, particularly suited for rendering surgical instruments absolutely aseptic without injuring them as to temper or surface, says the *Digest*. In the *Chemiker Zeitung* (Cothen) we find an account of the experiments made by G. Seiffert and A. Spiegl to test the value of glycerin in this respect, as taken from an article in the *Zeit. f. Bak.* (Journal of Bacteriology). The test was made with bacilli of tuberculosis, and it seems rather ominous to be assured casually that these are easily obtainable at any abattoir! When heated in glycerin at a temperature of 120 degrees centigrade, every germ tested was completely killed at the end of one minute. This included not only the germs of diphtheria, anthrax, and chicken cholera, but those of "B. Coll., Paratyphus B. Bac. pyocaneus, Bac. subtilis, V. Mitrshoeff, Staphylococcus albus, and Streptococcus brevis." Surgical instruments were found to be entirely uninjured by this process, even when heated for a full hour. Moreover, they could be kept permanently in the bath without rusting. Rubber tubes were not merely uninjured by the treatment, but were even restored to elasticity by it when they had become a bit brittle.

Partial Dentures

W. E. CUMMER, D.D.S., L.D.S., PROFESSOR PROSTHETIC
DENTISTRY AND APPLIED DENTAL PHYSICS, ROYAL
COLLEGE OF DENTAL SURGEONS, TORONTO.

(Continued from March issue)

SINGLE STUD.

A stud is a positive retaining device, used usually in conjunction with other retaining devices located on the opposite side of the mouth, and consisting of a projection of slightly inverted cone shape of about 14-gauge (Brown & Sharpe), and about 3MM. long, which engages in a recess in an inlay, crown, bridge, dummy, or similar. (Fig. 19.) Is usually used with dentures having a loss of teeth on



Figure 19.—(a) Frame work in position. (b) First step in removal, clasp raised. (c) Second step, clasp free of bicuspid, piece moved laterally disengaging stud. (d) Framework. (N.B.—Insertion done in reverse order, stud placed first, then clasp.) Inlay shown in section.



Figure 19A.—Proper shape of stud. (a) Cylindrical stud closely fitting a cylindrical hole, does not allow other side of denture to pass other retainers (Fig. 19B) without dislodging inlay. (b & c) Cone shaped stud. Fair only, as allows play when stud is not perfectly seated. (d & e) Inverted cone form good. No play in any position of stud.

one side only, and in conjunction with a rest or indirect retainer, is made to engage in a horizontal direction in the hole or recess, then on the other side with other attachments, such as clasp, Roach, Gilmore, etc., the saddle slipping home in a vertical direction. The removal of the piece is done in reverse order, pulled away part vertically and then horizontally, disengaging the stud as per example.

RING AND STUD.

In certain cases, such as those in which the attachment is desired on a shell crown, half hood, or similar comparatively thin covering

on the lingual side of a tooth, the process may be reversed and a stud soldered thereunto upon which a ring may be engaged. This has an advantage also in the case of elderly persons and persons of poor sight, enabling them more easily to "find the place," but should not be used on inlays as the dislodging movement may be too great, due to leverage. (Fig. 20.)

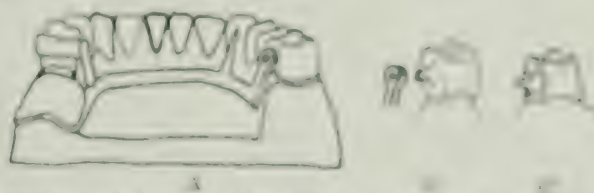


Figure 20.—Illustration of Figure 19. Stud soldered to crown rim and cemented for this in a ring mounted on framework. The stud can be pulled across lower M. O. D. as similar for possibility of binding and dislodged or broken off.

DOUBLE STUD.

In occasional cases studs may be opposed to one another to advantage, the appliance being removed by springing the studs together, thus releasing the piece. A very good example is a simple retainer for an obturator (Fig. 21), in which two inlays with recesses



Figure 21.—Showing use of the double-stud stud in an obturator frame. Two inlays with circular 14-gauge recesses are made for the lingual surface of the molars. A piece of flattened 14-gauge platinum and gold wire is stretched across the palate (B), and armed at each end with a stud, upon each is attached the obturator frame. The piece is removed by springing one of the studs lingually (C) in releasing the piece, and the insertion is accomplished in reverse order, one stud engaged first, then the other across into position. (See Fig. 25, Pages 146 and 147.)

were made on the lingual sides of both the upper first molars and an arch of 14-gauge wire rolled flat and armed on each end with a stud, and with mesial and distal rests preventing rotation. This springs in and out, providing a very satisfactory attachment for an obturator, with the cutting of only two inlay cavities on the lingual side of the upper first molar.

MESIAL OR DISTAL STUD.

A very neat, efficient and sanitary restoration may be made in cases involving a space on one side of the mouth with good teeth at both ends of the space, and on the other side a space with a tooth at one end only, as per Fig. 22. A stud is fitted in a mesial inlay with a rest on the first bicuspid, while a clasp or similar engages the

opposite bicuspid. The piece is held down diagonally opposite with the distal stud and clasp, and the resultant force from the rest engaging in the inlay on the first bicuspid (left) presses the saddle firmly into position. (Fig. 22.)

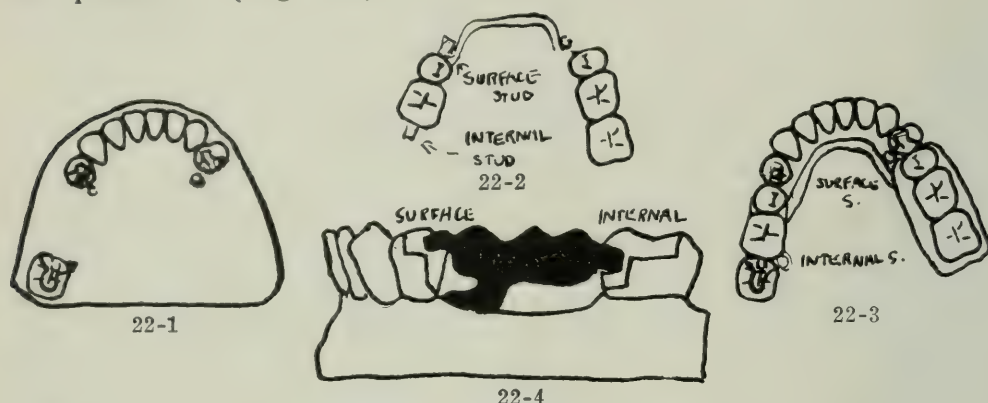


Figure 22.—Distal stud used in the mesial of an inlay. (22-1) Case with inlays. (22-2) Denture with left distal (internal) studs engaging in mesial recess in inlay, occlusal stud engaging in occlusal slot in inlay in lower left first bicuspid toward mesial. (22-3) Piece in position. (22-4) Sectional view of left side of case.

COMPOUND RETENTION OF DENTURES (BY INTERLOCKING DEVICES OF TWO ELEMENTS).

This class of retainer involves stationary fixed abutment to which one of the two elements is attached, by solder, such as crown, stationary part of removable bridge, inlay with (or occasionally without posts) (for which devitalization is usually necessary to secure strength). Absolute parallelism is necessary in the case of the platinum hood and split plate and its various modifications, the tube and split post, the engaging plates known as the Morgan attachment, and similar.

Regarding this class of retainers accuracy is of paramount importance, and instruments for measuring the distance between the retaining teeth, and calculating from the depth of cavities necessary for the reception of the retainer as well as placing in parallel relations the retainers themselves for soldering as well as for holding the parts themselves during soldering, are available, constructed with all the care and accuracy of high grade mathematical instruments, for the assistance of the dentist in securing his results. While the study of the use of these retainers of precision (primarily designed for removable bridgework) and the technique involved representing the work of Peeso, Chayes, Ash and others, is particularly relevant to partial dentures, inasmuch as a large percentage of these depend on the mucosa for support with the teeth for retainers, yet properly presented would fill a number of papers. Particularly for short spaces, with a tooth at each end of the space, the above methods produce results unapproached for neatness, sanitation and reproduction of natural contours in artificial work.

The well known Roach attachment, consisting of a split tube slipping over a ball (Fig. 22A), which not requiring the absolute parallelism of the foregoing, yet, due to the contact of the two elements being the line around the circumference of the ball only, may be set with quite sufficient parallelism without the aid of special "jigs." The action of the Roach attachment is purely tension-friction, and also allows for "settling" without placing an undue strain upon the tooth or teeth involved. Carefully placed in the central position in the em-

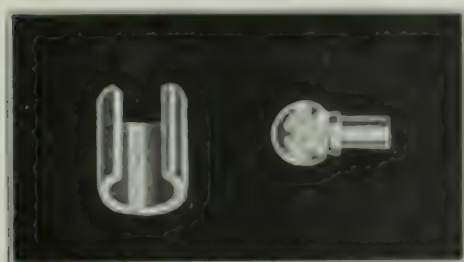


Figure 22A.—Roach attachment.

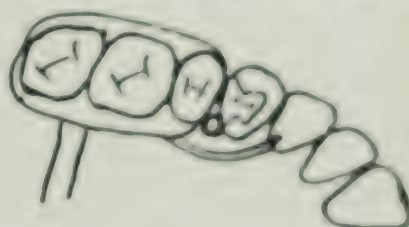


Figure 22B.—Showing correct location of tooth attachment in center of abutment.



Figure 22C.—Close-up view of Gilmore attachment in its proper position and gold wire.

brasure (Fig. 22B), in combination with similar or other means of both direct or indirect retention, a multitude of efficient, sanitary and unobtrusive combinations may be obtained. Attention is directed to articles in Oct., 1915, *Review*, G. W. Coltrin, and July *Review*, F. E. Roach, 1915.

The equally well known Gilmore attachment (Fig. 22C), which consists of the 14-gauge wire with the special Gilmore clasp fitting it, admits of some range of application. Some discrimination is required in its use, as any undue settling, due to the more or less horizontal position of the wire, is apt to place an undue tipping stress on attached tooth. This undue stress is more apt to come in locations to which Gilmore wire is attached to single teeth. With cases in which the wires span an intervening space between two teeth, or project from each side of one, or one or more splinted teeth standing alone, the tipping tendency is greatly minimized. In metal saddles this may be largely avoided, provided the ridge is not too flabby, by constructing the saddles with the 14-gauge wire, held to the abutments by wax only, returning to mouth and pressing down, dislodging the 14-gauge wire toward a position of ridge-stress.

INDIRECT RETENTION

May be spoken of as the utilization of a force (P) remote from that part of the denture to be retained, between which another of the direct forms of retainers is interposed (F), the resultant force (W)

tending to seat the saddle more firmly in position. This scheme or system of retention may be used in a great number of modifications, chiefly in saddles with support at one end only. For example (Fig. 23): As it stands, there is nothing to prevent the saddle dropping down, but with the addition of a "rest" (Fig. 24), the slightest tendency for the saddle to drop results in an upward pressure of the "rest," the piece being held in the centre line by the Roach attachments, and thus with adjustment, an unsupported saddle may be made to press up into its position even in excess of that pressure really required. It

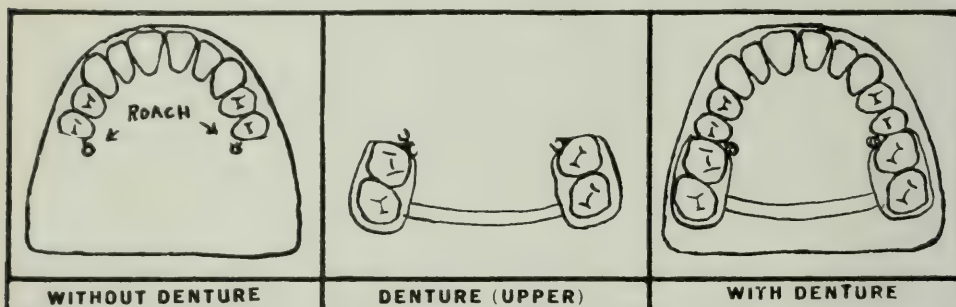


Figure 23.—Indirect Retention. As constructed this case would not be a success. Nothing to prevent saddle from dropping at rear.

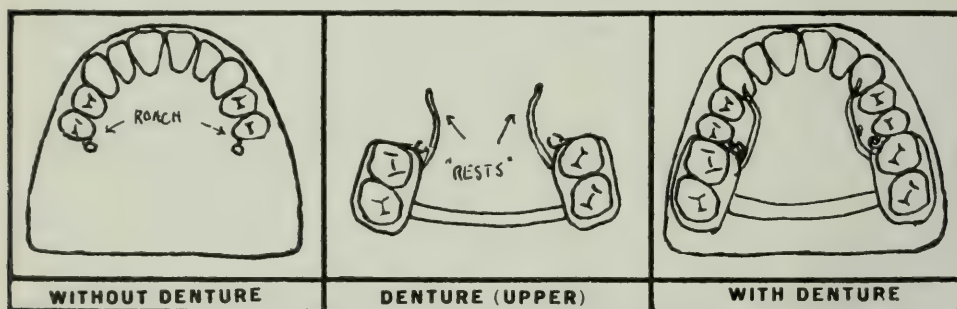
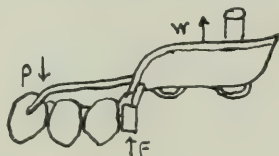


Figure 24.—Indirect retention. With the addition of rests (in centre cut) any tendency for the saddles to drop is instantly checked by the rests touching cuspsids. (Fig. 25.)

P	F	W	LEVER 1ST CLASS, Ex- CROWBAR, SHEARS.
↓	▲	↑	
▲	W	↑	LEVER 2ND CLASS, Ex NUT CRACKER, TRIM BOARD
▼	↑	P	
	↑	W	LEVER 3RD CLASS, Ex HUMAN JAW, SUGAR TONGS.
	P	↑	



ONE HALF LINGUAL VIEW OF ABOVE. P. INDIRECT RETAINER OR "REST" ACTING THROUGH A DIRECT RETAINER (F) RESULTS IN UPWARD MOVE. W.

Figure 25.—Indirect retention is an application of the lever of the first class. Lower cut represents a lingual view of one half of case in Figure 24. The piece is held in the centre (F lower cut) by the Roach attachment. Any downward movement of saddle is prevented by rest passing forward and touching cuspid. Therefore the cuspid, acting on the rest might be considered as the P, or power of the lever. The Roach as F, or the fulcrum, and the retaining or upward reaction on saddle, as W, or the work of the first class lever. See upper drawing for levers.

may be noted that the rationale is a modification of the lever of the first class, in which in this particular instance the power may be likened to the "rest" pressing on the cuspid, the fulcrum, the Reach attachments and the work, the resultant force which tends to press the saddle firmly in position. Here follows a number of examples of cases in which indirect retention is used. It will be noted that only two direct retainers are used in all cases, and that skeleton construction in all cases away from the gingival margin is recommended (Figs. 25, 26, 27, 28.)

CLASS A.—DIRECT RETAINERS DIAGONALLY OPPOSITE.

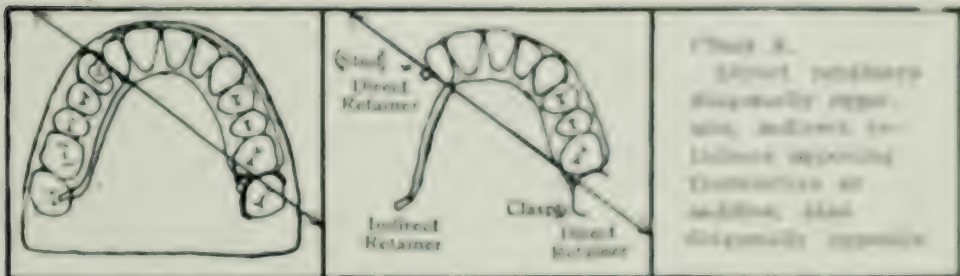
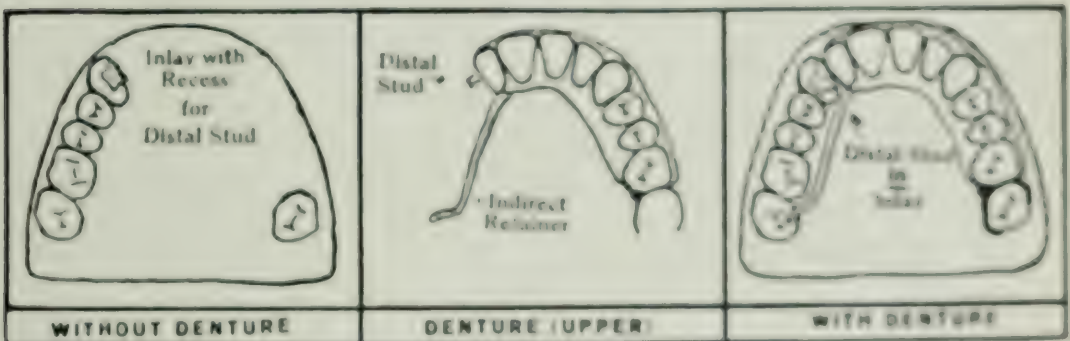
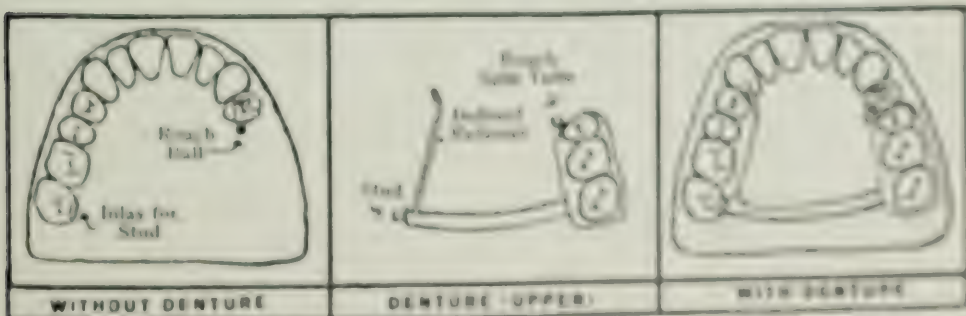


Figure 26.—Class A. Direct retainers diagonally opposite.

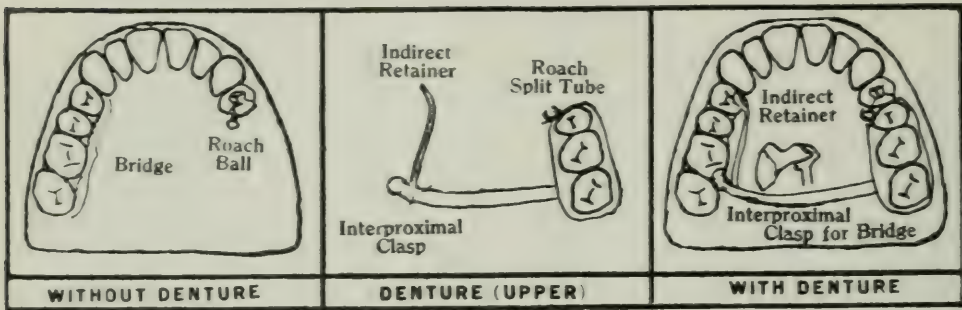


A1.—Condition as shown. Preliminary work before impression, steel with recess for stud (leave in wax) to work with spring metal for construction in drawing in impression framework, saddle, with metal stud, indirect retainer and clasp joined to base with 14 gauge wire as shown. Insertion and retention, stud first slips in place then clasp. Through these direct retainers saddle is held in place by the indirect as shown.

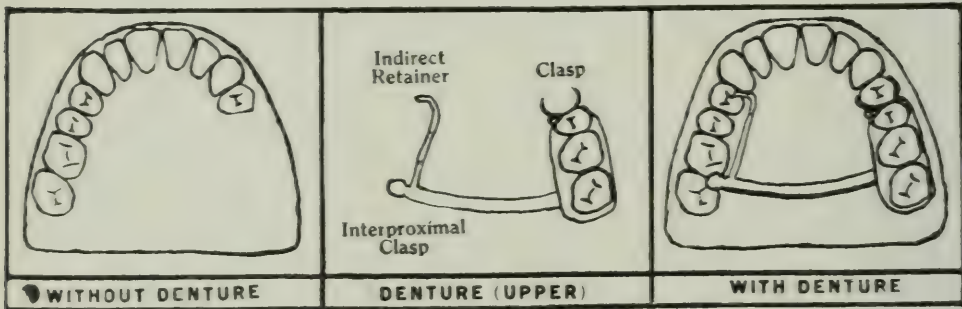


A2.—Condition as shown. Preliminary work before impression as shown in first cut. Framework as shown. Insertion and retention, stud slip in last, Reach tube then slips over ball in inlay, acting through these diagonally placed direct retainers, indirect regularly holds pressure part of saddle.

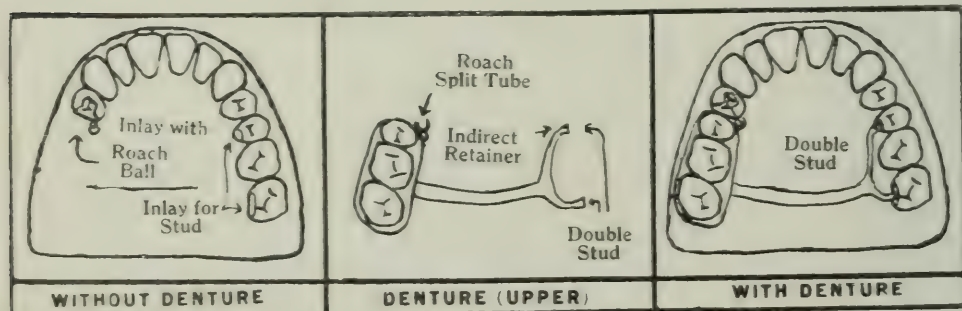
CLASS A.—DIRECT RETAINERS DIAGONALLY OPPOSITE.



A3.—Condition as shown, similar to A2, except bridge. Preliminary work before impression core under bridge, and inlay as shown. Framework as shown (note interproximal clasp in right hand drawing). Insertion and retention, interproximal clasp first, Roach attachment next, through these indirect retainer acts as case A2.

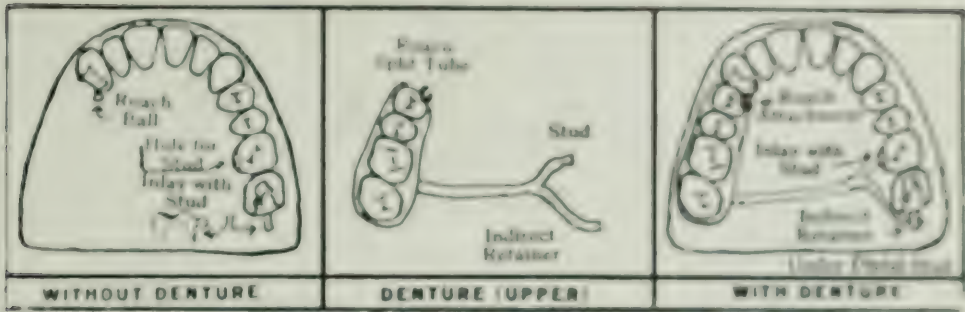


A4.—Condition as shown. Preliminary work before impression making. interproximal clasp from wax pattern applied directly to teeth. Framework as shown. Insertion and retention, interproximal clasp in position first, then clasp, indirect retainer through these diagonally, opposed retainer E acts as saddle, similar to case A2 and A3.

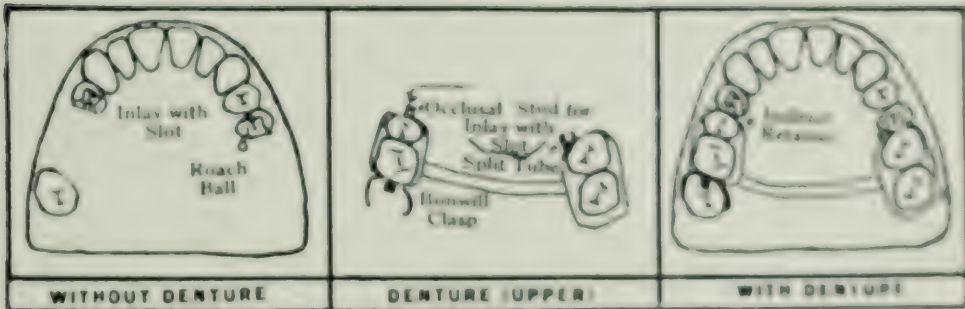


A5.—Condition as shown. Preliminary work before impression, inlays complete (without Roach ball) with sprue left on. Framework as shown. Insertion and retention double stud in inlays first, then Roach tube in ball. Anterior stud indirectly retaining saddle through posterior stud diagonally opposed to Roach attachment. (P.S.—Might be considered as a class B case, considering the anterior stud as a direct retainer diametrically opposed to Roach attachment. See class B.)

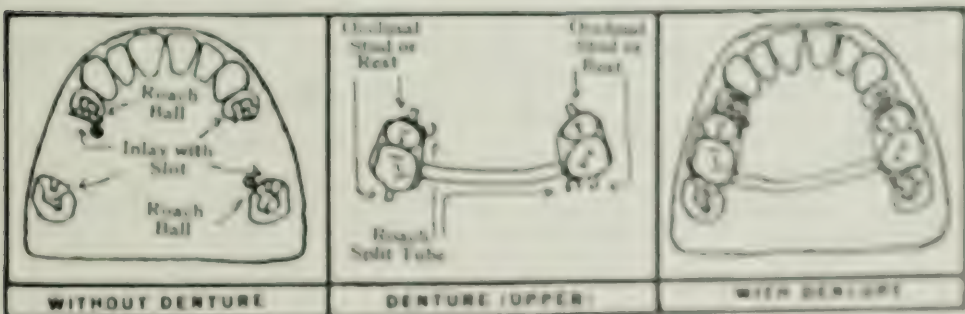
CLASS A.—DIRECT RETAINERS DIAGONALLY OPPOSITE.



AD.—Condition as shown. Preliminary work before impression, inlay without stud, and Roach Ball, but with inlay apron. Framework as shown. Insertion and retention indirect retainer under distal stud, stud in inlay, then Roach split tube over ball. The direct retainers, the Roach attachment and the stud in the lingual inlay on molar, act diagonally opposite, and any downward movement of the saddle which is incident with a downward movement of the indirect retainer is checked by the distal stud on the second molar inlay.

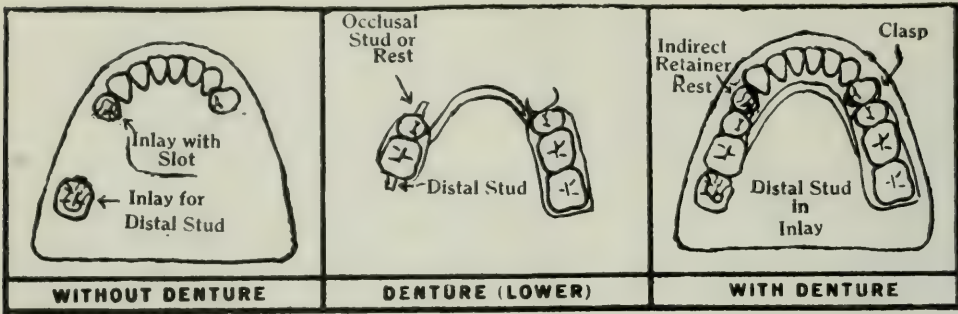


AE.—Condition as shown. Preliminary work before impression, but with inlay apron, apron absent. Framework as shown. Insertion and retention, goes directly to glass, the preclinal stud indirectly retaining the opposite saddle through the Roachwell clasp, and the Roach attachment diagonally placed. Note that the upper right first bicuspid and second molar show the action of mastication with the mucosa under the saddle.

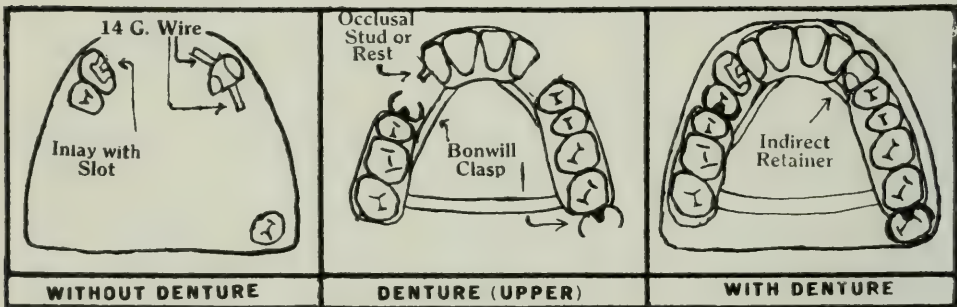


AF.—Condition as shown, similar to AE, except molar on left. Preliminary work before impression. Inlays are shown with slots for H groups with. Framework as shown. Try in mouth with inlay in glass and without grade held in wax only. In divide pressure between both and mucosa. Insertion and retention, directly to glass, study distal and left molar under inlay with retaining one another through the diagonally opposed Roach attachments.

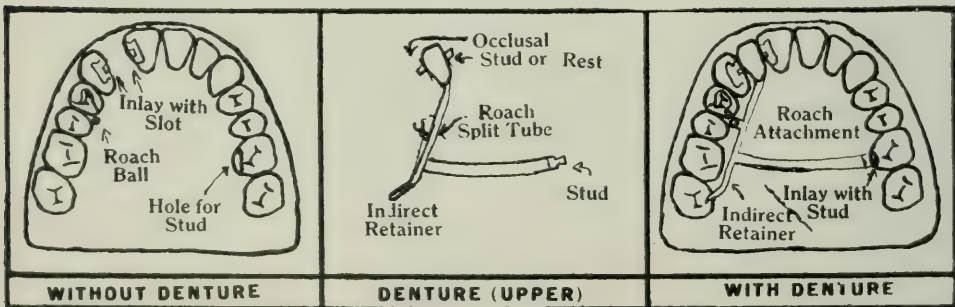
CLASS A.—DIRECT RETAINERS DIAGONALLY OPPOSITE.



A9.—Condition as shown, (See Fig. 22.) Preliminary work before impression, inlay with mesial recess on molar inlay, and inlay with slot on bicuspid, as shown. Framework as shown. Saddle on left side may be omitted if desired. (See Fig. 22). Insertion and retention, distal stud in inlay first, occlusal stud next, clasp last. Occlusal stud indirectly retains saddle on opposite side through diagonally opposed direct retainers, viz.: distal stud and clasp.

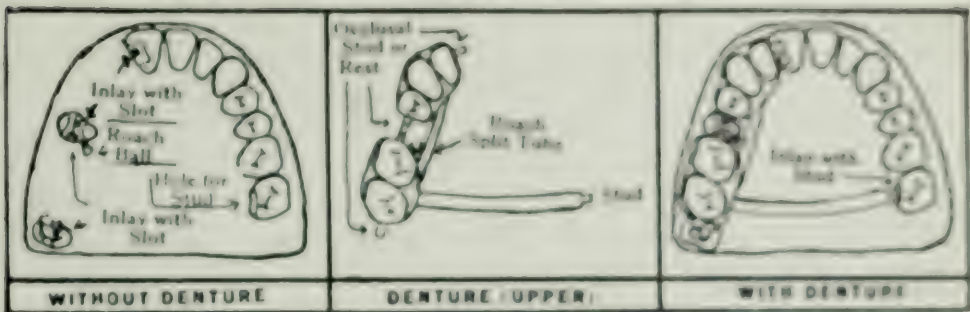


A10.—Condition as shown. Preliminary work before impression, inlays as shown, with uncut sprue in position. Framework as shown. Insertion and retention, directly to place, diagonally opposed, Bonwill clasps retain directly, mesial and distal wires from left cuspid under saddle indirectly retain right saddle and weight divided between teeth and mucosa.



A11.—Condition as shown. Preliminary work before impression, inlays as shown, with uncut sprues. Framework as shown, swaged cup bearing Dentsply, Goslee or other crown. Insertion and retention, stud first, balance directly to place. Indirect retainer, through Roach attachment and stud reacts on crown with double occlusal studs.

CLASS A.—DIRECT RETAINERS DIAGONALLY OPPOSITE.



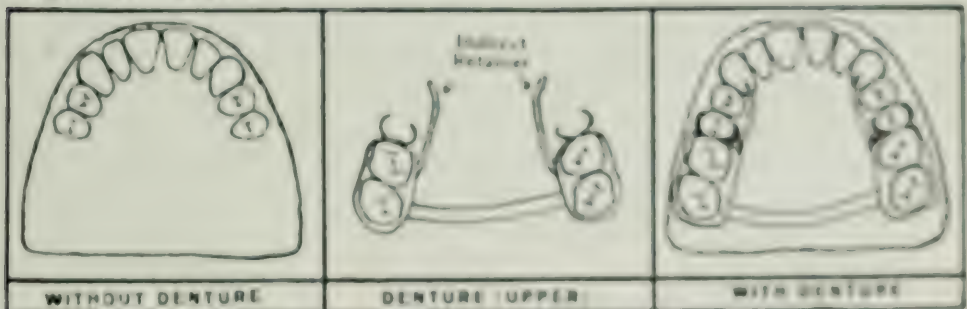
A12.—Condition as shown. Preliminary work before impression. Inlay as shown, with abut spruce. Framework as shown. Insertion and retention stud first, balance directly in place. Saddle and vertical posts maintain one another through the diagonally opposed tooth attachment and stud.

CLASS B.—DIRECT RETAINERS DIAMETRICALLY OPPOSITE.

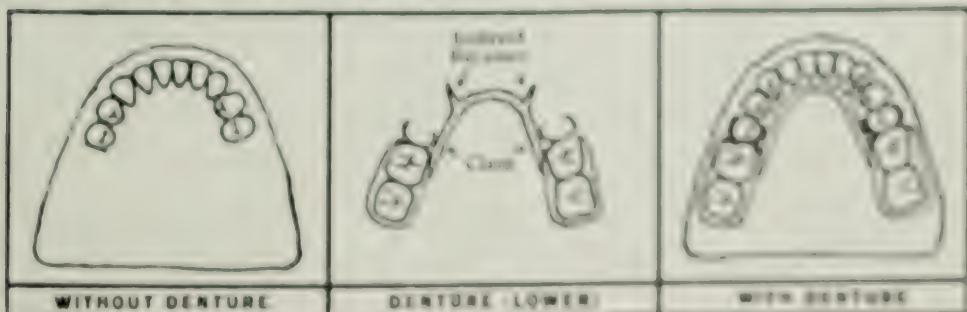


EXAMPLE CASE D1.

Figure 27.—Class B.

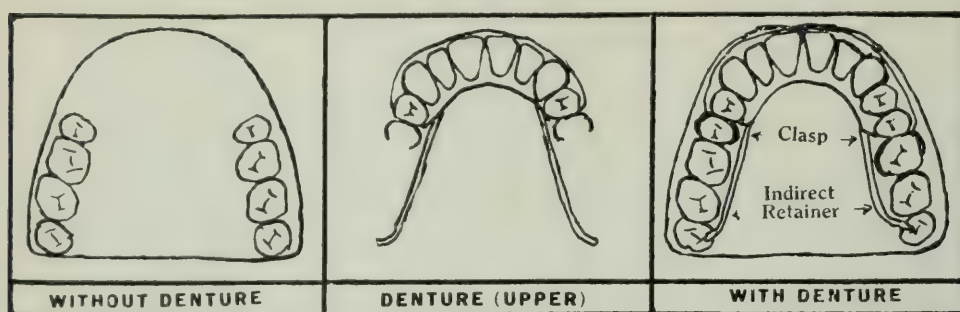


B1.—Condition as shown. Preliminary work before impression, indirect impression. Malar's cusp and clasp fixed to bridge. Framework as shown. Insertion and retention directly in place. Indirect retainer resting on saddle through diametrically opposed clasp. (See Figure D1 and D2.)

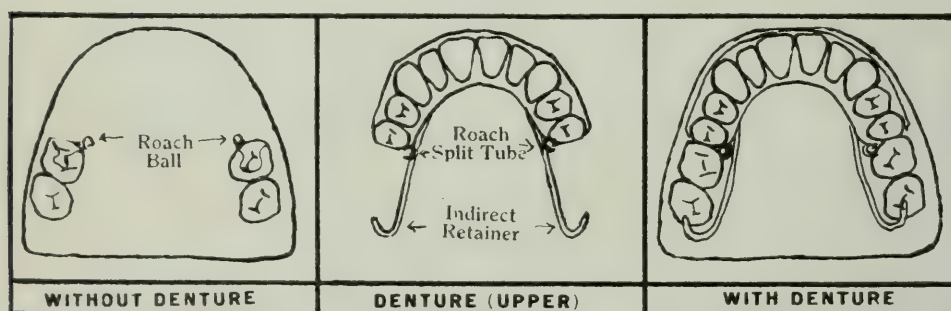


B2.—Condition as shown. Preliminary work before impression, indirect impression. Malar's cusp and clasp fixed to bridge. Framework as shown. Insertion and retention directly in place. Indirect retainer resting on saddle through diametrically opposed clasp. same as B1.

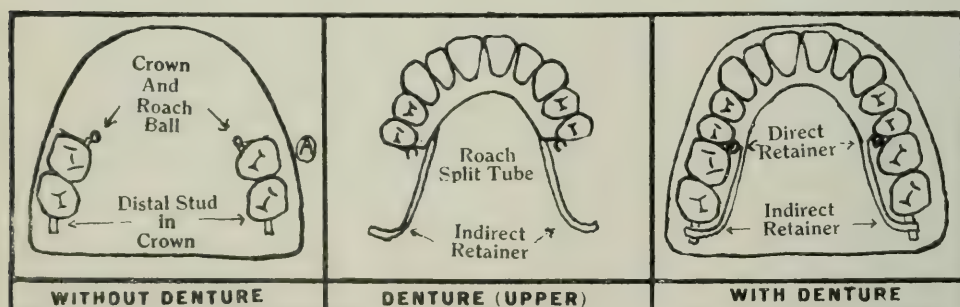
CLASS B.—DIRECT RETAINERS DIAMETRICALLY OPPOSITE.



B3.—Condition as shown. Preliminary work before impression, individual impressions, etc. for clasps. Framework as shown. Insertion and retention directly to place. Indirect retainers react on anteriors, saddle through diametrically opposed clasps.

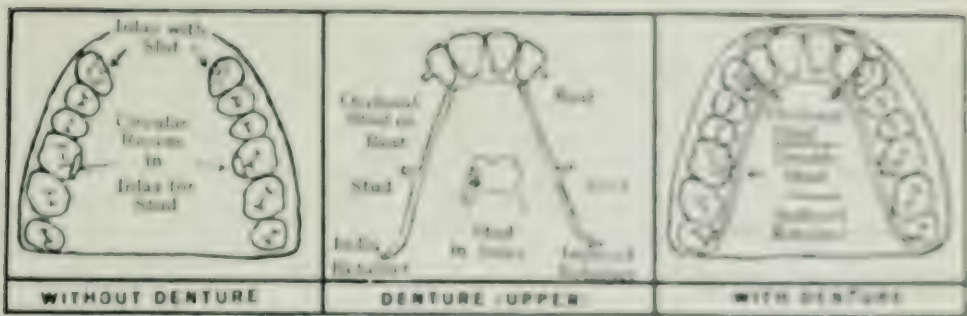


B4.—Condition as shown. Preliminary work before impression, two inlays. Framework as shown, Roach split tubes mounted on 14 gauge wires in turn mounted on indirect retainers. Insertion and retention directly to place. Indirect retainers react on anterior saddle through diametrically opposed Roach attachment, similar to B3 and B5.

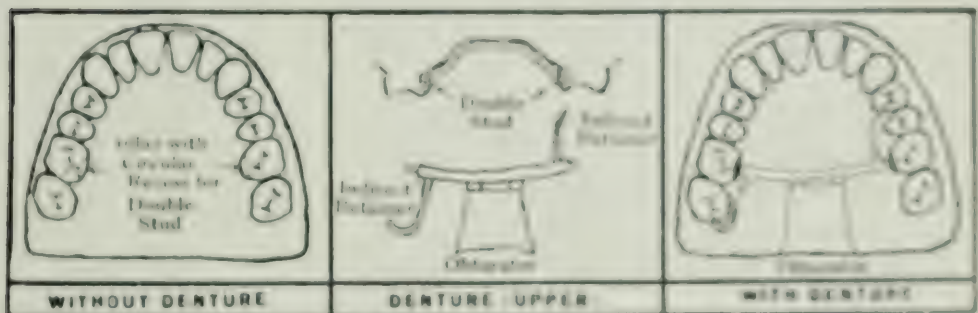


B5.—Condition as shown. Preliminary work before impression, inlays as shown. Framework as shown. Insertion and retention directly to place. Indirect retainers react on anterior saddle through diametrically opposed direct retainers, (Roach attachment) similar to B3 and B4.

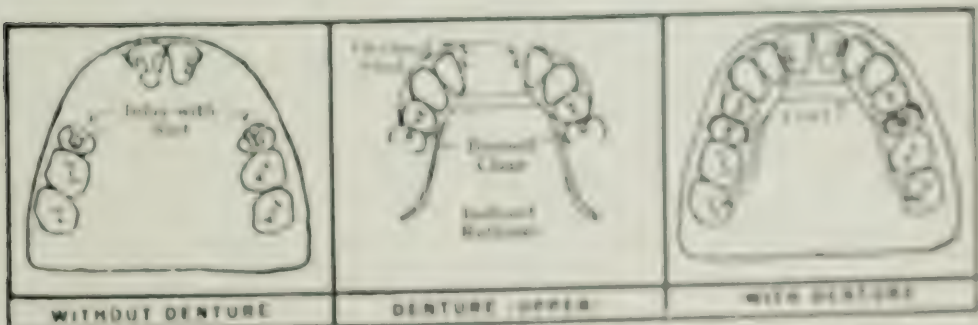
CLASS B—DIRECT RETAINERS DIAMETRICALLY OPPOSITE.



12.—Condition as shown. Preliminary work before impression, inlays as shown. Framework as shown. Extension of 18 gauge wire and gold wire, slightly flattened. Studs mounted on inlays, retainers as shown. In section in middle sketch. Dissection and retention. One stud inserted the other spring into place. Indirect retainer rests on middle through base.

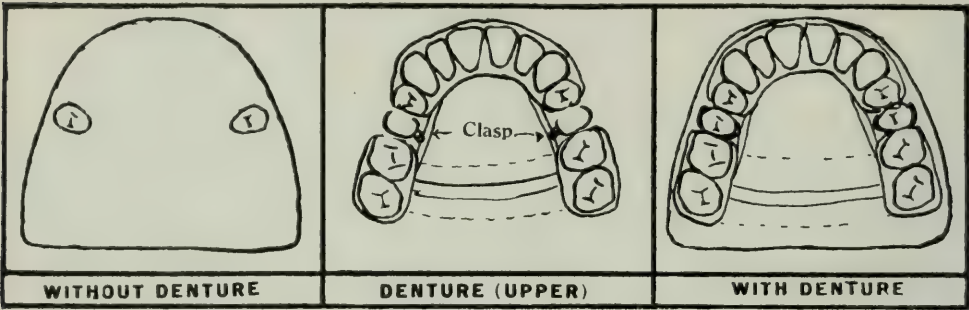


13.—Condition, cleft palate, all teeth healthy. Preliminary work, record impression, inlays as shown. Framework as shown. Hinge, etc., for retention mounted on bar 18 gauge slightly flattened platinum, one gold wire. Insertion and retention. One stud bent, then across the opposite stud to support cleft palate rest on one another, supporting the plate. One Class B.

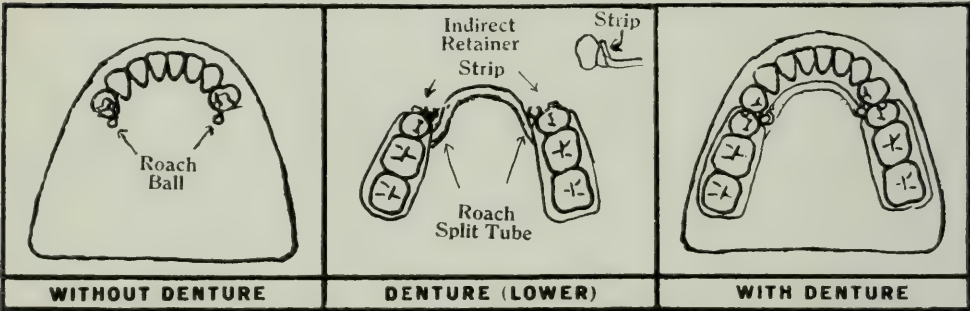


14.—Condition as shown. Preliminary work before impression, inlays as shown. Framework as shown. Note the heavy inlay rest on middle. One Class B. Dissection and removal directly in place. Indirect retainer rest through Bonyll inlay. Note that remaining teeth place inlay.

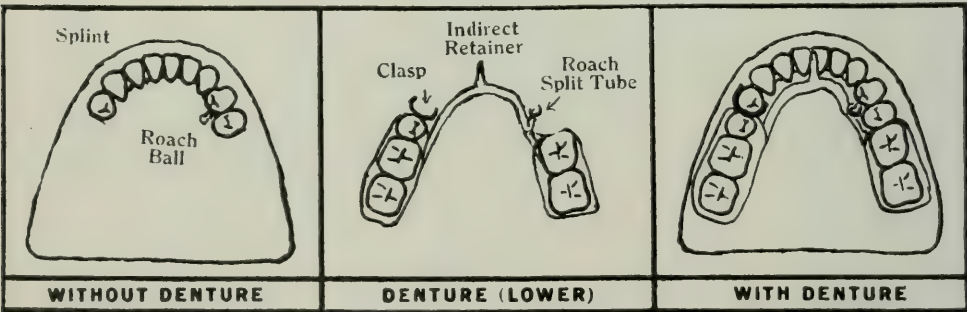
CLASS B.—DIRECT RETAINERS DIAMETRICALLY OPPOSITE.



B9.—Condition as shown. Preliminary work before impression, forming clasps from individual Melotte's metal casts. Framework as shown. Distal saddles joined either by bar or plate, depending on area required. Insertion and retention directly to place, anterior and posterior saddles indirectly retaining one another through clasps. Direct retainers diametrically opposite.

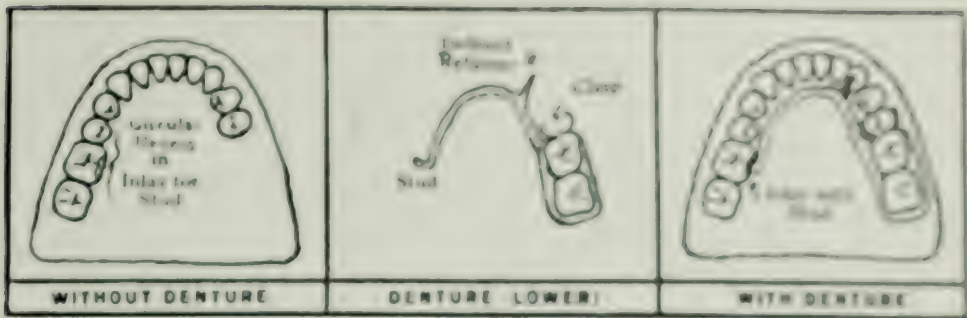


B10.—Condition as shown. Preliminary work. Inlays as shown. Framework as shown with 18 gauge platinum and gold stud touching distal of bicuspid inlay. Insertion and retention. Strips react on saddles through Roach attachments. Not recommended for similar, upper.

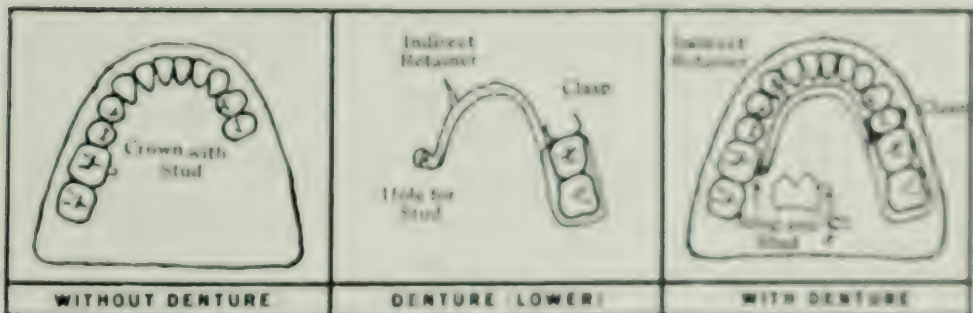


B11.—Condition as shown. Sound teeth at end of series not attached to splint. Not desired to cut these. Preliminary work. Splint from left cuspid to right first bicuspid, latter splint end to bear Roach ball. Framework as shown, Roach tube set on 14 gauge wire or lingual bar. Insertion or retention directly to place. Indirect retainer reacts on saddle through diametrically opposed Roach attachment clasp.

CLASS B.—DIRECT RETAINERS DIAMETRICALLY OPPOSITE.



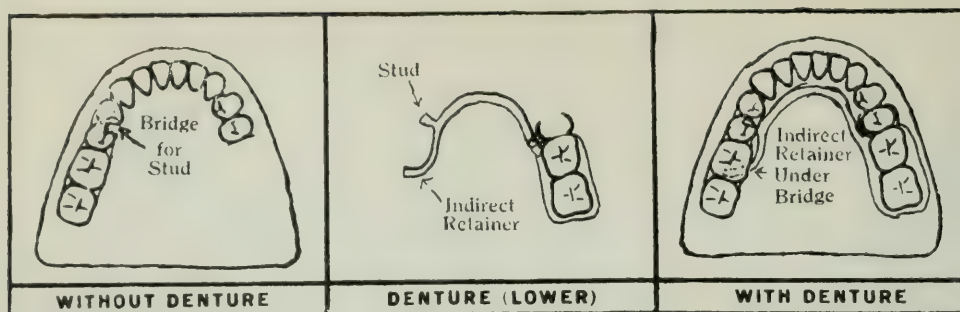
112.—Condition as shown (see Fig. 19). Inlay in place. Preliminary work before impression. Inlay as shown. Framework as shown. Insertion and retention stud in inlay, then clasp. Indirect retainer rests on molar through diametrically opposed clasp and stud. Direct retainer diametrically opposite.



113.—Condition fully broken down lower left first molar, others as shown. Preliminary work before impression. Crown, for molar. Framework on studs with ring fitting in stationary stud on molar crown. Insertion and retention, ring over stud first, then clasp. Clasp and ring and stud retain. See Fig. 20. Indirect retainer rests on molar through stud.

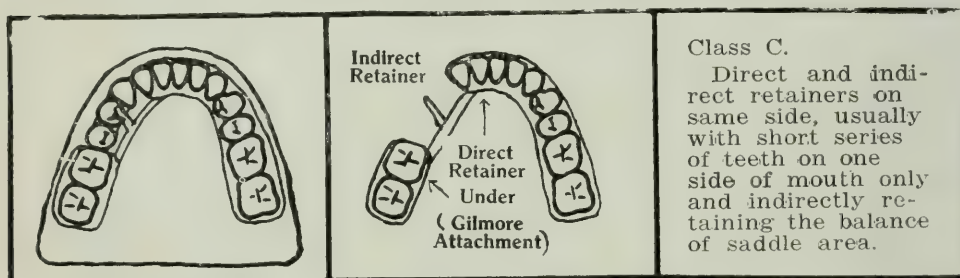


114.—Condition as shown. Preliminary work before impression. Stud as shown and with inlay in place. Framework as shown, stud will be placed on indirect retainer. Insertion and retention. Framework contains bearing teeth rests on molar through diametrically opposed clasp.



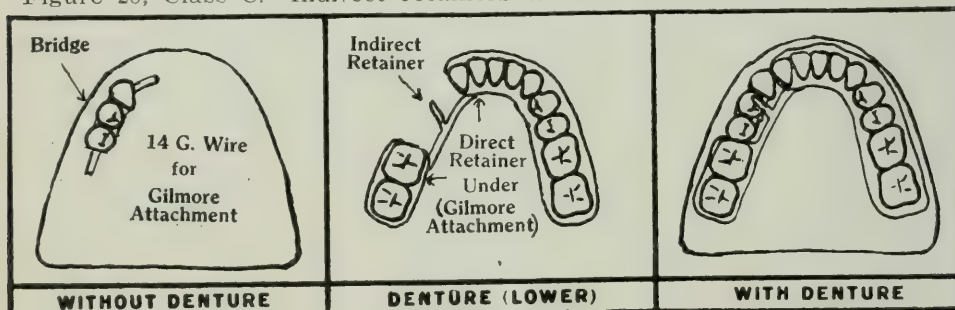
B15.—Condition as shown with so-called Hygienic bridge, removal not desired. Preliminary work before impression, cores under bridge, drill hole and fit 14 gauge wire. Framework as shown. See last chapter of this article. Insertion and retention. Stud in hole in bridge first with indirect retainer under, then clasp. Any upward movement of saddle arrested immediately by indirect retainer under, then clasp. Any upward movement of saddle arrested immediately by indirect retainer under bridge, acting through diametrically opposed stud and clasp.

CLASS C.—DIRECT AND INDIRECT RETAINERS ON SAME SIDE.

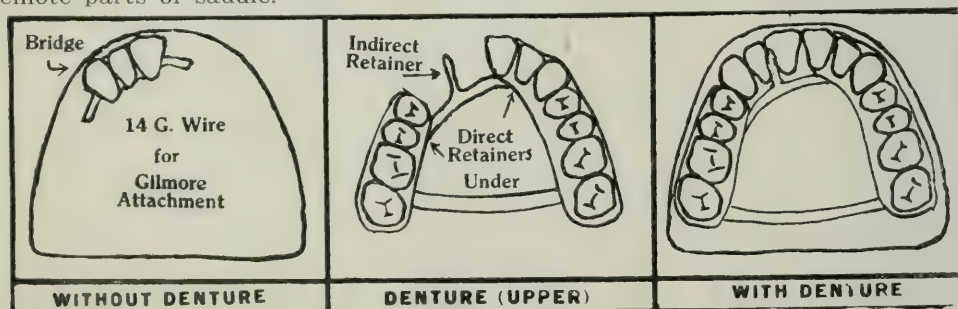


EXAMPLE CASE, C1.

Figure 28, Class C.—Indirect retainers on same side.



C1.—Condition, lower left cuspid and bicuspid standing. Preliminary work before impression, splint these and add Gilmore wires. Framework, saddles joined by bar, carrying two Gilmore attachments, and indirect retainer. Insertion and retention held down directly by Gilmore's indirect retainer holding remote parts of saddle.



C2.—Condition, upper right central, lateral and cuspid standing. Preliminary work, splint these and add Gilmore wires. Framework saddle joined by bars, indirect retainer added to anterior bar, Gilmore attachments under. Insertion and retention. Directly by Gilmore, distally by indirect retainer acting through Gilmore attachment.

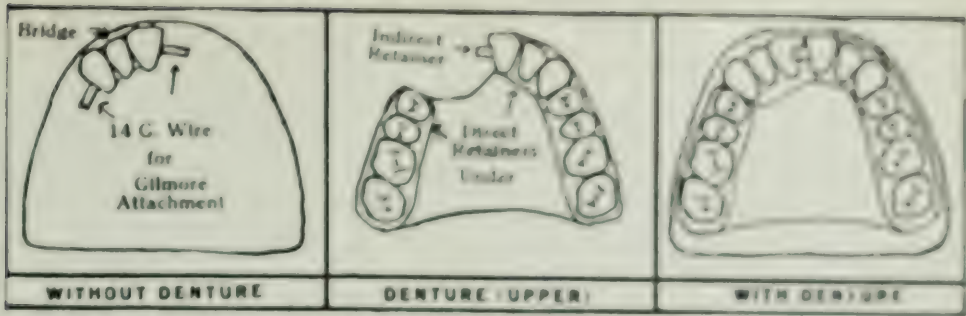


FIG. 28.—Illustration shows an $\overline{12}$, except force of adhesion is shown to hold anterior three teeth. Indirect retainer, same as $\overline{12}$. Transverse, real, curved, bearing adhesion, indirect retainer as shown. Illustration and retention same as $\overline{12}$, except for the additional force of adhesion shown by retaining teeth.

REGARDING THE POSITION OF REST.

Rule (A)—The greater the distance of the "rest" or indirect retainer from the direct retainer or an imaginary line joining the direct retainers, the less the strain on the retainer or retainers and the tooth or teeth supporting the direct retainers. The resultant force is only the weight of the saddle, plus slight gum resiliency, less friction. (The "rest" and saddle being equidistant from the direct retainer or retainers.) (Fig. 29. A, B, C, D.)

(B)—Should the "rest" carry the weight of mastication, it should, as a rule, be seated in an inlay. (Fig. 4.)



FIGURE 29A.—Showing position of indirect rest on tooth. Rest on support of indirect rest on tooth. Note the separation of two direct parallel lines, rest and saddle being almost equidistant from line of direct retainers.



FIGURE 29B.—Showing double line favorable position of indirect rest, close to the line of the direct retainers, shown by the separation of direct parallel lines, some leverage on "saddle" indirect rest.

FIGURE 29C.—Indirect rest on tooth. Illustration is separation of indirect rest on tooth. Illustration is separation of indirect rest on tooth.

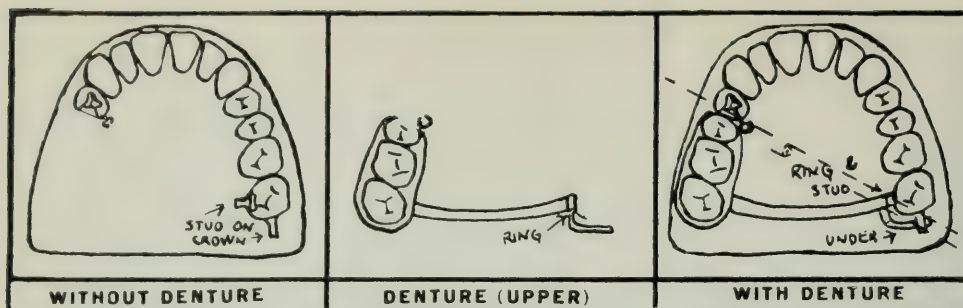
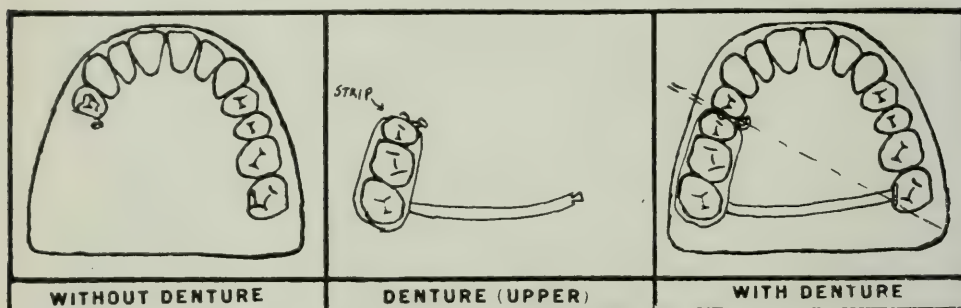


Figure 29C.—Showing another less favorable form and position of the indirect retainer even closer than 29B to line of direct retainers, also shown by separation of dotted lines. More leverage than preceding design, and confined to one tooth only.



Showing another form and position, least favorable, of indirect retainers (strip of metal acting on bicuspid inlay), almost in line with line of direct retainer. Reaction also confined to one tooth only.

POSITION OF "REST."

(C)—Should always arch over the gingivae. (Fig. 29E.)

(D)—A slight advantage, due to the elimination of the elasticity of the central bar, may be secured by placing the indirect retainer on the same side as the saddle. (Fig. 29F.)

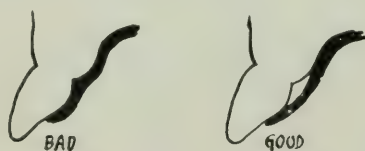


Figure 29E.—Indirect retainer should arch over gingival margin.

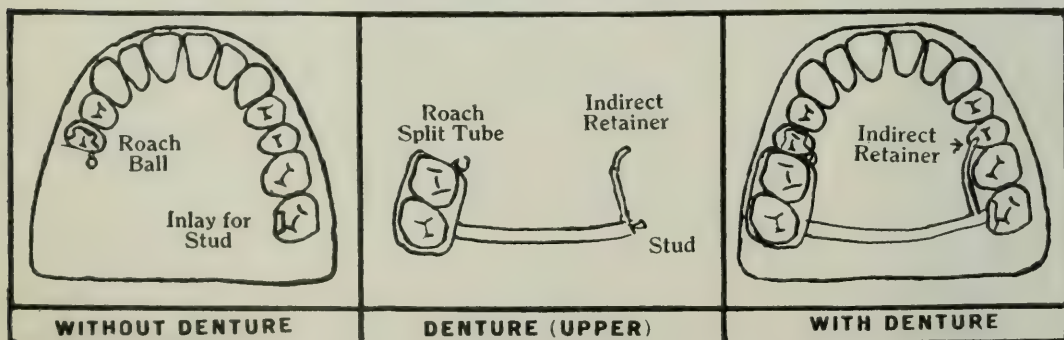


Figure 29F (a).—Design showing indirect retainer on opposite side of case to the saddle.

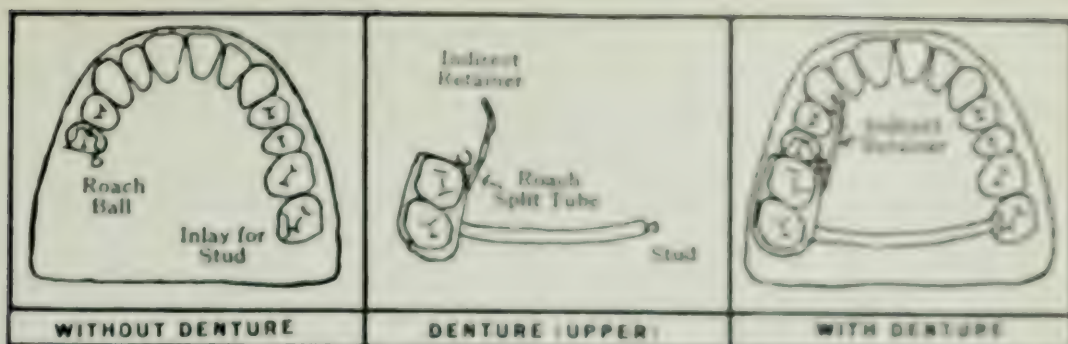


Figure 21P (b).—Design for upper arch, showing indirect retainer on first side. Slight advantage here in eliminating necessity of bar in front of, from indirect retainer. This arrangement (middle and indirect retainer on same side) is desirable, provided the middle and natural teeth allow of it.

Figure 21P.—An instance illustrating point of slight loss of efficiency through the springs of an intermediate part in same case.

TECHNICAL PROCEDURE

As may be gathered from the foregoing, the design of a really sanitary and mechanically efficient piece is a matter for considerable reflection, and in many instances calls for a set of skiagraphs of the whole mouth, careful root and pulp canal treatment, extraction of doubtful teeth, and then a pair of study models. In addition to the mechanical consideration suggested in the foregoing, as entering into the design of a partial denture, the element of the possible loss of a tooth or teeth should be kept in mind, and the piece designed accordingly. The design of the denture having been worked out, all crowns, posts and cope (without porcelain), inlays (leave space on for drawing from tooth in impression) and various other elements (preferably without dummies) should be completed and placed in the mouth.

TRAYS.

From the study model a stock tray of Greene-Kerr, Supplee, or any of the newer patterns, designed to avoid muscle action, may be adapted, or a special tray cast in pure aluminum in each case, preferably with detachable handle, the wax pattern for which may be formed from the study model, or from model of impression compound rapidly obtained by pushing softened impression compound into previous denture and inverting on wet glass slab, cooling and separating.

Dental Service in a Toronto Orphanage

BY ARTHUR DAY, D.D.S., TORONTO.

THE children of the Sacred Heart Orphanage, Toronto, have been receiving dental treatment for about two years, and there has been a marked improvement in the health and general efficiency of the children.

The orphanage contains over two hundred children. Their mouths are examined at least once a year, and the dental defects are then corrected with as little delay as possible. The only work outside of these regular periods is when a child is admitted or one of the children suffers toothache. This latter contingency, however, very seldom arises.

Notwithstanding the fact that it has been only possible to make a yearly examination, there has been a marked improvement in the general health conditions of the orphanage. Of the two hundred and twenty-five children, the girls and boys are in about equal number. Their ages range from six to eleven years, and they both live and go to school in the Institution. This latter fact makes it possible to keep the matter of oral cleanliness thoroughly under the supervision of the teachers.

The Superioress reports that since the children have been getting their teeth attended to their disposition, as well as their general health, has been noticeably better; the children have lost no time from school through toothache; it takes less time for the Institution to have the dental work done; and, in the opinion of the Superioress, it is an actual economy to maintain a free dental clinic. The Sisters in charge of the classes advise that almost without exception the children become more alert and seem to learn more quickly in school, and have also noticed the general health improvement.

The following cases may be mentioned in particular:

Case 1.—Madeline L., age thirteen years, considered deficient; placed in private families at two different times, but in each case was returned to the orphanage being considered deficient. She has since had her mouth put in a condition of health, and is now quite up to standard in school, and competent for her age in performing her duties about the orphanage.

Case 2.—Annie W., age fourteen years; was never even considered as sufficiently advanced to place in private family. Since having her teeth attended to she is very much improved in class and especially valuable in her duties about the house.

Case 3.—Hazel and Francis J., ten and eight years respectively; before dental attention were always complaining of illness, losing much time from school; were anæmic and lifeless. After dental treatment these children brightened up, were ready to play and romp

at recess time; took an interest in their studies and seemed like different children altogether.

Case 4.—Joseph and James H., age eight and six years respectively; were miserable, puny and pale-faced and subject to toothache. After dental treatment a marked difference was noticed in both children. They now look much better and brighter, and are more interested both in class and play.

The orphanage Nurse makes an interesting report, intimating that up to the time the regular dental inspection and treatment was carried out there were regular epidemics of contagious diseases—Scarlet Fever, Diphtheria, Measles, etc., but principally Diphtheria. Since the mouths of the children have been cared for there has not been an epidemic of any kind and not a single case of Diphtheria or Scarlet Fever. The Institution has been operating for twenty-five years, and never before in its history has it passed through a year without Diphtheria, and at times has had Diphtheria in the orphanage continuously for twelve months. Consider this evidence. Twenty-five years with Diphtheria epidemics and without regular dental treatment; and then—teeth filled, roots extracted, mouths regularly brushed in the proper manner, and not a single case in two years. Is this a coincidence, or is it proof of the necessity of school dental clinics?

This report in connection with the Sacred Heart Orphanage is of particular value, in that it is supplied by those having charge of the children during the whole twenty-four hours of the day, and answers the possible suggestion of the sceptic that the improvement in health could be attributed to some other changed condition in the children's home life. These facts have been reported to me by those in charge of the orphanage, and not by enthusiastic members of our own profession. I have refrained from adding my own opinion. ORAL HEALTH would not be big enough to hold them in the present enthusiastic state of my mind. Besides, it is better to have reports, such as the above, from authorities other than practising dentists—they speak louder under such circumstances to other governing bodies.

I desire also to pay tribute to the assistance rendered by the Municipal Dental Clinic and to the unvarying courtesy from Dr. Bathwell and his co-laborers.

In conclusion, I only wish to state that children can learn to brush their mouths as well as adults can; and that the children at the orphanage, as a class, brush their teeth as well as any group of my private patients, and taken individually there are some who do it much better.

Dental Clinics for the Children of New York

MATTHEW CARNEY, D.M.D., NEW YORK CITY.

WITH a constantly increasing number of ailments directly traceable to defective teeth, the actual need for free dental clinics for school children is not only conceded by leaders in the medical profession, but is fast becoming realized by the municipal health and educational authorities and the public in general. Even the taxpayer upon whom the burden falls, in the case of free dental clinics that are supported by the municipality, is beginning to realize that preventive medicine and preventive dentistry are not an expense, but the essence of true economy.

If there exists any question as to the actual value of institutions founded to arrest dental decay and give good masticating apparatus to the children, one needs but to look at the results accomplished by our dental clinics in New York.

The dental clinics were organized in January, 1913, by the Department of Health of New York, and associated with the Bureau of Child Hygiene. There were six clinics opened and a staff of nine clinical dentists and one supervising dentist installed. These men were selected after a competitive civil service examination that gave them the rating and salary as men of their grade in the medical profession. In the examination, experience counted 40 per cent. and the theoretical paper 60 per cent. Three of our clinics are equipped with two complete outfits and three are single clinics. Each clinic has a trained nurse in charge, whose duty is to attend to the sterilization of instruments, assist the operator at the chair, and perform the clerical work. Associated with each clinic is a school nurse, whose duty it is to bring the children to and from the clinic, investigate the cases, and ascertain whether or not they are proper patients for charity treatment. The clinics are open daily the year around, from 1.30 to 5 p.m., and on Saturday mornings from 9 a.m. to noon.

The equipment was purchased on competitive bids, and the cost of installing a complete dental outfit in each clinic was approximately \$775. When these clinics were first started, we accepted as patients all school children up to 14 years of age. This plan was in operation up to the opening of the fall term of 1913. Careful observation of the clinical work performed in this country, and the statistics compiled by foreign clinic committees, convinced that the most good could be accomplished by restricting the age limit to eight years, accepting only members of the first and second grades, and thereby striking at the root of the evil, and putting the child's mouth in good condition for the reception of the permanent dentition and preserve the first permanent molars and corner-stones of the dental arch, before they had become too far gone.

This plan was adopted with gratifying success, as it enabled us to treat more children than ever before; for the teeth had not decayed to such an extent where they required long treatments for putrescent pulps and devitalization. When we found the temporary teeth in putrescent condition, they were usually so far gone that extraction was the most advisable method of procedure.

The scope of work performed in the clinics is limited. We do extractions, using a local anaesthetic where indicated, plastic fillings, that is, cement and amalgam, cleanings and treatments. The present registrations in our Public Schools is approximately 950,000, and of these children at least 600,000 are in urgent need of dental treatment.

The number of clinics is so small that we are unable to begin to cope with this tremendous problem, we have simply blazed a trail through this jungle of decay. Since the opening of our clinics in January, 1913, we have operated on approximately 26,000 children. About 16,000 have been discharged as cured, 6,000 were dropped from our records for various reasons, chief among these are incorrigibility, failure to keep appointments and removal from the district. We have inserted over 150,000 fillings, and extracted upward of 40,000 teeth, of which number over 35,000 were deciduous. Every child that has attended our clinics has had the teeth thoroughly cleaned before being dismissed.

The work that has been done has demonstrated its value in many ways; it has awakened the public to the fact that the teeth of children are important and have a decided influence upon the physical and mental development of the children. It has reduced the number of absentees in the schools, and enabled the child to devote his time to study and making his promotion more certain, and has thus reduced the cost of education, for the money required for the re-education of the children left behind each year is a very large amount. The old adage of "an ounce of prevention being worth a pound of cure" must have been written by a dentist.

The single unit idea that has been adopted in New York is the solution of the dental clinic problem. It is far more serviceable and more efficient than having one central clinic. These smaller clinics, situated as they are in the hearts of congested school districts, are easier of access and better patronized than if the dental efforts of the city were being carried on in one institution remote from the congested areas.

The preventive side of dentistry should constantly be impressed upon the fertile mind of the young patients. They should receive talks on brushing the teeth and the advantages of a clean mouth every time they visit the clinic, and these instructions should be amplified and enforced in the class-room.

The supervision of the work in the municipal clinics is an important factor. The various lines of treatment to be followed in the comm-

tion of the varied conditions falls entirely upon the supervisor. He must see to it that the work is uniform throughout the city, and that each operator is both competent and conscientious.

In January we intend to open up five clinics in the school buildings. We believe that this new departure will have many an advantage to offset some of the objectionable features of a general dental clinic in a Public School building. Suggestions and instructions given by a competent dentist, aided by the invaluable co-operation of the teacher, will do much toward having a path through this wilderness of decay.

I believe that the dental work should be both corrective and preventive, and that both branches should be performed in conjunction. After the mouth has once been put in good condition, it should be a comparatively easy matter to keep it so. The dental nurse can follow up these children in the class-room and give them their future prophylactic treatments in the mornings when the dental clinic is unoccupied by the dentist. With the co-operation of the teachers in the class-rooms and the mothers in the homes reconstructive dental work should be reduced to a minimum.

If precaution be taken to see that proper habits in the care of the teeth are formed during the impressionable age of childhood many of the ailments that are directly traceable to defective teeth will be avoided in later years.

We have merely laid the foundation for this work, and the results lead us to believe that we have started right. These clinics are an insurance against the spread of the diseases of childhood, and aid materially in the making of better, healthier and more useful citizens.

Periodontia for the General Practitioner

BY PAUL R. STILLMAN, D.D.S., NEW YORK CITY.

FROUDE, the philosopher, has said: "The knowledge that a man can use is the only knowledge that has life and growth in it, and converts itself into *practical power*. The rest hangs like dust about the brain, or dries like rain-drops off the stones." In this sense, it should be impressed on those among you who have not yet grasped the fact, that pyorrhea, that "thorn in the flesh" of most general practitioners of dentistry, may, and *should be* treated successfully by all.

To acquire the necessary knowledge on the subject, and the technique in the use of the proper instruments needed in its surgical treatment, seems to me to require no greater gifts in dexterity and application to an idea than does the problem of the cohesive gold foil filling. Remembering the first agonized attempts of the freshman in college, in this comparison the cohesive foil filling is, to my mind, by far the more perplexing.

It is the speaker's belief that the secret mind of the dental profession at large is one of fixed pessimism, when brought face to face with the subject of successfully treating typical tooth-shaking, pus-flowing pyorrhea; that a despair enters the mind of the otherwise capable dentist, to whom all other branches of our work seem simple in comparison. This is not as it should be. The discerning public is now demanding relief, and its enquiring mind will lead it to places where relief may be obtained. Every dentist should be able to cure a large percentage of cases coming under his observation, and to prevent development of the disease in all. Those men who have already taken up the work have found, in their own practices, a sufficient number of cases to employ their time and enhance their incomes without recourse to active competition in acquiring good cases for treatment from other sources. New cases will come to all who demonstrate their ability to obtain results that are satisfactory.

So many and so various have been the essays and papers on the subject of pyorrhea that to attempt any review of them would tend to confuse the mind. Much has been written in the past, that to-day is only of historical interest. My advice to anyone wishing to improve his understanding of the present state of scientific thought, is to carefully read the written works of Dr. Thomas B. Hartzell, of Minneapolis. His writing contains fewer utterances of doubtful value and more that is sound, practical and true than those of any other man who has written on the subject. All that Dr. Hartzell has given us will be of present value to men who desire to increase their learning, and is literature based upon research, scientifically recorded and comprehensively presented.

Those who have studied the etiology of pyorrhea, as it appeared in the literature of dentistry in the past, will remember, that in earlier days, opinion divided itself into two schools, viz: (1) those who considered the symptoms as local manifestations of an unknown systemic disorder, due, perhaps, to faulty metabolism, diabetes, uric acid diathesis, etc., and who looked to the pharmacopoeia for relief and to the forceps as the only surgical procedure that seemed certainly successful; and (2) those who treated the disease surgically and believed it was a purely local infection of the periodontal membrane, caused by certain exudates or concretions known as tartar, the removal of which always improved the symptoms.

In refutation of the first school, recent investigators in the bacteriological field have brought out the fact that nearly all lesions or diseases known to mankind are of bacterial origin, and that, instead of diabetes, uric acid, etcetera, being the causes of pyorrhea, we have every reason to believe that many of these supposed causes are, in fact, dependent on just such conditions as pyorrhea presents, to produce a focus of bacterial infection.

The pioneers of the second school, represented by Dr. John M. Riggs and his followers did effect cures. Paradoxically, it is of

interest to note that Dr. Riggs gave his first public clinic and demonstrated his method of surgical treatment in 1869. Up to the present time, some of the ablest minds of our profession have doubted the efficacy of the surgical method, and have given ear to those who attempted to teach easier ways and methods; but the truth of Riggs' idea stands vindicated, for to-day every specialist who is treating the disease has to depend upon surgery for success.

Most of the cases that come to us are the result of years of neglect, personal neglect on the part of the patient, and neglect due to indifference and lack of ability on the part of the dentist. The disease is usually in an advanced state when relief is demanded, and much permanent havoc has taken place, extraction often being the only remedy. What misfortune, and only neglect as reason for it! These shaking teeth stand like dilapidated tomb-stones in memoriam of our deficiencies as members of a learned profession. And, saddest of all, while our watchword should be conservation of the teeth, in this most destructive disease that attacks them, we have done so little to prevent or cure.

That we may get down to a working basis, may I present to you my line of procedure in handling a case of pyorrhea?

After examining the whole oral cavity, a record of the conditions as presented should be made. Explore all deep pockets to ascertain the extent of the lesions. Any dental work presenting such conditions as over-hanging margins, lack of proximal contact point allowing for the impaction of food in mastication, or unnatural contour of fillings or inlays should be corrected or removed from the mouth, no matter how recently the work has been completed. Let me impress upon you the importance of making records of all examinations. This is a necessary procedure in diagnosis and a particularly valuable asset in study.

The beginner may not get far beyond the facts that a patient has agreed to pay a certain sum of money, that the diagnosis is pyorrhea, and that certain individual teeth seem to be beyond the aid of mortal man; but, in great seriousness, I advise that these simple beginnings of records of cases be made for the academic benefit to be reaped later. This procedure will often arouse your enthusiasm for study and scientific application, and you will highly value these early attempts to understand.

The use of the X-ray in diagnosis has become quite general among the men who are making the treatment of this disease their special work. Radiographs will often confirm a diagnostic opinion, and records of cases are far more valuable when supplemented with them. They show positively the bone destruction in the alveolus and offer further proof as to suspected necrotic or septic areas. The radiograph plainly shows us when *not* to attempt the impossible in treatment, and, conversely, is a strong argument when we are obliged to

condemn for extraction certain teeth that the patient wishes to save. Experience and familiarity with types of cases are necessary to develop ability in diagnosis.

Oral prophylaxis is the next step in our treatment, and this is both preventative and curative. To do efficient work along this line is so essential and yet so simple, so gratifying in results both to patient and dentist, that to neglect it is incomprehensible.

Every mouth presented for any dental service whatever should be prepared for the operation by having standard prophylactic treatment, and this rule is particularly pertinent in the treatment of pyorrhea, for no good surgery may be accomplished in an unclean mouth. Asepsis makes all surgery possible.

The conditions that make for immunity against pyorrhea place the burden largely upon the patient. Success depends, not alone upon the skilful surgical technique of the operator, but also upon his ability to so imbue the patient with enthusiasm and produce desire for oral cleanliness that he becomes keen on the idea. He must distinctly understand that if his mouth is to be cured of a disgusting and disease-generating condition, he himself must work unceasingly to that end.

Whatsoever of personal success I have attained in this work, I attribute largely to the fact of so shaking up the consciousness of patients to the importance of this phase of treatment that they would sooner miss a meal than neglect a mouth toilet.

This requires minute and careful instructions. The tooth-brush should be small and of good quality, and each individual should possess three, so that a dry one is always available. The brush is used in such a manner that no surface of the teeth, either lingually or buccolabially is neglected. The gingival border is the point of infection in all cases, and it is here that the patient's attention should be directed. The stroke should describe a small circle no longer in diameter than the bristles of a brush. Tell patients to brush all the surfaces of all the teeth. Show them how to do it in pantomime at their first visit, then watch and correct deficiencies in their technique and encourage them in their work. Regular and sustained oral hygiene in every case which undergoes treatment is in the final analysis the *summum bonum* of immunity.

Almost every case of pyorrhea presents teeth that are loose. My observations have led me to believe that a large percentage of these loose teeth are in a state of traumatic occlusion. Some have no antagonist in the opposing jaw, it is true, but it may be found that the occluding tooth has been lost since the looseness developed.

Trauma of the bite is the most aggravating symptom of the entire problem and, in my practice, it is the first symptom that receives attention. To illustrate: An upper bi-cuspid presents for treatment because of soreness, and the examination reveals that, when the jaws

are closed and the teeth in contact, this individual bi-cuspid is thrust in the line of least resistance. It receives a distinct shock each time the jaws are closed, which drives it into its socket, the tooth immediately resuming its former position when the pressure is released. Such a case can only be relieved by grinding. Now, when such a condition presents in a mouth, it is usually accompanied by a similar condition, although in less degree, in some, or all of the remaining teeth. A lateral stress on the teeth, when in closed position, will usually disclose movement if the tip of the index finger is rested gently on the suspected crown, just at the gum margin. I cannot be too forceful in the following statement: No prophylaxis, no root surgery, no medication and no splints will improve the condition until the trauma has been entirely removed by grinding. We must grind the occlusal surfaces of these teeth even if they are sensitive, even if there is no enamel left, and even if they are reduced to stubs. It may be necessary to remove the pulps and to fill the root canals, but in any case there will be no improvement from treatment if this shock to the periodontal tissue is not relieved. This work is dental surgery as a last resort. It is grind and relieve trauma or lose the teeth.

Now I am not advocating that you use a large wheel carborundum stone and deliberately shorten the tooth until it is no longer dislodged by occluding. This may be done if one is desirous only to save the tooth or where, in the case of a molar, the tooth is destined to carry a crown or act as an end abutment in bridge work; but in most cases where the osteoclasia is not extreme, one desires only to relieve the aggravating symptoms, and ruthless or extreme grinding would so mutilate the occlusal surface, that the tooth could never functionate again unless an artificial occlusal surface restoration were made. Entire and complete rest in all these cases is the desired object. Use carbon articulating paper to define the exact ultra-occluding contact point, and a variety of small carborundum stones in the engine hand-piece, and grind only such surfaces as are marked by the carbon paper, sometimes on the lower jaw, sometimes on the upper. Urge the patient to a free use of the lateral movement of the mandible in marking the teeth.

The natural wear on the occlusal surfaces of the teeth ceases when trauma is established, and the object of the operator is to so grind the teeth that the same effect and appearance as in natural attrition is attained. Try to preserve the natural tooth form and give *all the time that is necessary* to the operation. I have recently spent nine hours on one case in grinding the bite for the relief of this condition before the result was satisfactory. Those who have made a study of the Gysi method of anatomical occlusion in articulating artificial teeth will understand the significance of this. Those who have not *will* understand when they have accomplished one successful result. Correction of trauma by grinding is to me a fundamental necessity in the treatment of pyorrhea.

We now come to the actual surgery of pyorrhea and the selection of suitable instruments. These are of numerous designs and in sets bearing the names of the designers, nearly all of which produce equally good results when in skilful hands.

Dr. A. C. Ham, of Denver, states: "It is the surgeon and not the instruments that performs successful operations, though instruments of proper design are essential." The instruments used are of three distinct types, the planes, the curettes, and the files. Good examples of the plane type are the Carr set, which is composed of 150 instruments, the Hartzell and the Buckley sets, the two latter being modifications of the former and more suitable for the beginner. The plane is operated by a pull stroke from the point toward the handle, the plane bit, or knife, being set at the point, and so set that when the blade rests upon the surface of the root, a portion of the shank may, at the same time, rest upon the crown enamel. This gives the operator control and delicacy that a hoe instrument does not. Planes are especially valuable for good results in deep pockets. The curette is designed as a "push and pull" instrument. There are numerous designs of various manufacture. The Good-Younger set (Cleveland) is recommended for beginners. The Hutchinson modification of the Good-Younger instruments (made by Grafrath, N.Y.) are delicately formed and beautifully finished. Certain selections from this set are indispensable. The files, with a few exceptions, are obsolete in modern technique, but Hutchinson's set (made by Grafrath, N.Y.) are not designed as scalers in the true sense, and are valuable when used correctly.

In the deeper pockets on pyorrhetic teeth, there is a field of infected material in the cementum of the root surface that cannot be classed as calculus. It is a membranous-like substance that is easily removed by successive short strokes until a surface not unlike that of an ivory billiard-ball has been disclosed. After the cervical surfaces have been made clean, and, not until then, should the instruments be directed into the pockets. The advance is made by short steps in the direction of the apex. Each field is first made clean before advancing to the next, so that, when the depth of the pocket has been reached, all objectionable matter has been removed from the surface of the root.

When the necrotic membrane has been removed, instrumentation should cease. Deeper and below lie the more precious structure—the canaliculi and, once the hard outside layer of the cementum is mutilated by an accidental scratch or groove, there is little hope of receiving aid from those wonderful natural forces that make for reconstruction and repair. Hartzell has pointed out how these grooves are the cause of reinfection to the deeper layers of the cementum, and how unresponsive such teeth are to treatment.

I should like to say a word here about the use of, so-called, antiseptics and germicides that have been advocated. The use of these

agents is contra-indicated. Because of the well nigh impregnable position of this infection, the natural forces of defence against it are unsuccessful and the phagocytosis difficult. Then, too, the inaccessibility of the infected field is the great obstacle to the surgeon. Were these infected surfaces entirely exposed to our view, the question of surgery would not be pertinent to our subject. Together with mechanically reducing the necrotic surfaces, we must depend to a large degree on the aid of nature's own defence. The normal defence must be conserved, and any application of astringents or escharotic germicides in solution or otherwise, introduced into these pockets, is an irritative attack upon the normal defence.

The operation of clearing the root surface of all necrotic debris, usually starts a profuse hemorrhage, caused by the opening up of the small gingival arteries in the adjacent vascular tissue. This hemorrhage of fresh arterial blood brings to our aid the leucocytes and phagocytes, the army of defence, which is capable of doing more real harm to the invading bacteria than any known germicide. Particles of debris, whose removal by other means would present a difficult problem, are here flushed out, carrying along the remaining hoards of bacteria. After the instrumentation has completely unloosened the necrotic tissue and the hemorrhage has flushed it out, a clot forms in the space, sealing the wound for the osteoblasts to set up the process of repair, which begins immediately, and brings the charmed circle of cure about.

The prophylaxis and treatment of pyorrhea is no light responsibility upon us. The day will come when to have the average case of pyorrhea develop in slow ways under a dentist's supervision will take on the aspect of mal-practice. If dexterity in technique and experience in handling a marked case is not in hand, much can be done in prevention, although the first can be learned as well. Here, then, is real knowledge of the kind a man can use. It is the "practical power" to which Froude refers, and I feel that I serve you best by giving you the sort you can benefit by.

Your kind invitation to address you has given me the opportunity to make an appeal for greater knowledge on this subject, and my motive in coming before you is missionary. If I can leave behind me a desire in the hearts of some men to incorporate in their practice this most important branch of our work, to help in the stamping out of this health-destroying disease, I shall feel that my coming has not been in vain.

Erratum

In article on "Successful Practice of Dentistry," March issue, page 118: Read 5% instead of 6%.

Silicate Restoration of Peg-shaped Lateral Incisor*

W. E. WHITT, ABINGDON, VA.

THE first step is to repair the tooth as though you were to put a gold crown on it. This often requires very little preparation except to cut some small grooves in the enamel in order to give cement attachment.

Second, make a gold shell crown for the tooth, using any method you may choose. Be sure that the crown is proper size to correspond with the other teeth and make it fit snug at the gum margin. Also have it well reinforced at the incisal edge to withstand the stress that may be brought to bear on it in mastication. Slip crown in place in the mouth and with a small sharp excavator or instrument make a mark around the visible part of the crown; mark across the front at the gum margin and in each approximal space as far as the crown is plainly visible from direct front view. Remove and cut the entire front out to the outline marked. Be careful to preserve the band at the gum margin and the thickness of gold at the incisal edge. This can be easily done with a small emery stone. Replace the crown and see that you have not distorted it in any way, also that you have cut it sufficient to get rid of the appearance of gold at the front.

This done, you now cement the crown on the tooth as though you would a gold crown by filling with soft cement and holding your thumb over the front while you are forcing it in place and the cement is setting. Before the cement thoroughly sets you may remove any excess from the front, as this will save you the trouble of cutting it after it is hard.

Dismiss your patient and give the cement plenty of time to get hard and have them to return at another engagement; apply the rubber dam, remove enough of the cement around the margin of the gold to allow sufficient undercut for a filling. And all you have to do to have a piece of work like the specimen I present you here for your inspection is to put in a synthetic porcelain filling in the entire front of your crown, being careful in selecting your shade to match the other teeth and following the proper procedure in the manipulation of your materials, which are familiar to all of you who are using synthetic. This has advantages over the all-shell porcelain crown, or most any other form of crown you might choose to make, in that you have not weakened the tooth, you have not disturbed the life of the pulp; you certainly can come nearer matching the other teeth in color than with any other form of crown, and if the porcelain front should give way it is easily replaced.

In my judgment, this is a very satisfactory way, both to patient and yourself, to restore a peg shaped lateral incisor.

*Clinic given before Convention of the Virginia State Dental Society, Richmond, Va., November, 1918.



Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

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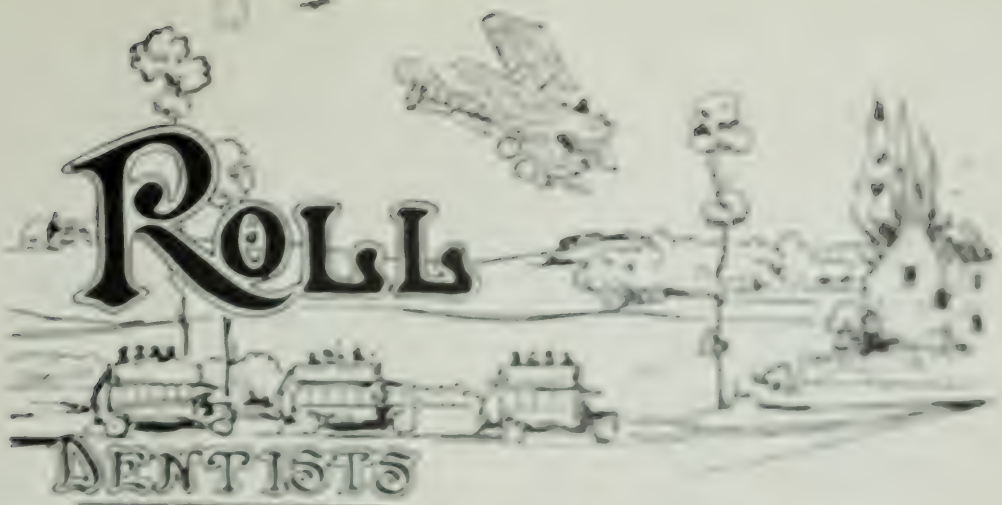
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MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

FASTENING STONES TO WORNOUT MANDRELS.—Wornout mandrels may be made to hold a stone well by placing a little soft cement on the screw and running to place in the engine.—*Australian Journal of Dentistry*.

TO KEEP MODELING COMPOUND FROM STICKING TO THE FINGERS.—Modeling compound, particularly if softened with dry heat, is likely to stick to the fingers. This can be prevented by rubbing a little coca butter on the fingers.—*H. Reid Staley (Dental Review)*.

REMOVING PLASTER FROM VULCANITE PLATES.—The dental laboratory worker sometimes finds, on removing a plate from the flask after vulcanization, that the mold or model plaster has formed a hard and strongly adherent layer of crystals on the surface of the vulcanite. Prevention is, of course, better than cure, and one ought not to be so careless as to leave the flask in water for some hours after vulcanization. In cases where one can afford to wait for the gradual action of a slow solvent, the following method will be found very satisfactory: The well-washed plate should be immersed in a strong or saturated solution of sodium throsulfate—photographers' "hypo"—and left in this solution overnight. On removal from the solution, it will be found that, in many instances, the incrustation has been entirely dissolved. Should some crystals remain on the plate, they no longer adhere closely, and they can be readily brushed away, leaving the vulcanite surface quite clean.—*Dental Record*.

BABBITT METAL.—The reason why Babbitt metal is preferable for dies is that it has all of the five requisites for a die, viz., non-shrinkage, hard enough not to batter, tough enough not to break, makes a smooth die, melts at a low temperature. It may be added that a plate swaged on this metal fits the plaster model.—*L. P. Haskell, in Dental Review*.

TO REMOVE TIN-FOIL FROM PLATES.—After burnishing foil over model, if you will soap it you will find that the foil will not adhere to plate. I very seldom use foil, but in soaping model after separation and letting it dry well I find it answers the same purpose as the foil.—*Literary Digest*.

PREVENTING THE CRACKING AND BLEEDING OF CHAPPED LIPS.—When a patient presents with chapped lips, which would crack and bleed if stretched, the lips are coated with recondiment. The lips will then be soft and pliable, and will stretch without cracking or bleeding.—*S. M. Myers (Texas Dental Journal)*.

SETTING BANDED CROWNS PAINLESSLY.—In those cases where the gums are particularly sensitive the cementing of a banded crown is sometimes quite painful. If a small pellet of cotton about the size of the head of a pin is dipped in 95% of phenol and passed with the pliers around the root just under the free margin of the gum a few times it will be found that the sensitiveness is greatly diminished. Have at hand some absolute alcohol, so that in case the phenol should flow on the tissues beyond the root the cauterizing effect of the phenol can be instantly checked with the alcohol.—*A. B. (Dental Review)*.

PUTTING THE TONGUE BEHIND THE SOFT PALATE.—Some weeks ago a patient came to see me complaining of a muco-purulent discharge from his nose, which he said he thought was due to nasal polypis. I examined his nose and throat, and could find nothing more than a post-nasal catarrh; however, he was not satisfied, and said he was certain that he had polypi, because he could feel them. On my asking how he could do so, he at once put his tongue right up behind his soft palate into the naso-pharynx; he said he could then feel a ridge in the middle and a soft mass on each side (no doubt the posterior ends of the turbinates), which he thought were polypi. The appearance on looking into his mouth during the manoeuvre was most peculiar; the soft palate was bulged forwards, and the tongue pushed up so far behind it that the uvula was in contact with the *frænum lingue*. I showed the case to four of my colleagues here, and as none of them had ever seen or heard of anyone who could perform this feat, I thought it might be of interest to put on record.—*F. O. Stedman, M.D., London (British Medical Journal)*.

THE TOOTHBRUSH HABIT.—When did the English first adopt the toothbrush habit, which is now being denounced by certain medical authorities? In "Esmond," Thackeray makes Lord Castlewood spend "a tenth of his day in brushing his teeth and the oiling of his hair," and in doing so the novelist commits a double anachronism. During the first half of the eighteenth century all fine gentlemen wore wigs and had no use for oil on their hair, whilst the toothbrush was so late as 1754 unknown to Lord Chesterfield. Writing to his son, Chesterfield says: "I hope you take great care of your mouth and teeth, and that you clean them well every morning with a sponge and tepid water, with a few drops of arxusluade water dropped into it. I insist upon your never using those sticks, or any hard substance whatever, which always rub away the gums and destroy the varnish of the teeth."—*London Chronicle (Dental Summary)*.

Military Efficiency Depends Largely Upon the Teeth

FROM lessons learned through experiences in the struggle at present progressing in Europe it would seem that the old saying, "An army travels upon its stomach," would have to be replaced by "The efficiency of an army depends upon the condition of the teeth of the individual soldiers." When the Kaiser lighted the torch which set Europe ablaze, the full importance of good teeth was, perhaps, not fully appreciated by the heads of the British War Office, and many of the territorials and reservists who were first called to the colors and volunteers who presented themselves for service were seriously handicapped by bad teeth. In some instances they had to be returned from the trenches in order that their teeth might be put in condition to enable them to eat hard biscuit and other rations served out to the army. It was found that if their teeth were not perfect they not only were unable to eat the food supplied them, but in some instances were rendered unfit for action through pain from defective teeth. Discovering this, the War Department took immediate steps to see that the men who presented themselves for enlistment had a perfect set of teeth or they were supplied with them before being sent to the front through the dental service for soldiers, which is now a perfectly organized department of dentistry in connection with the military hospitals, and in fact of the entire medical branch of the army, both in Great Britain and her colonies, as well as at the front.

Dentistry is playing a prominent part in caring for the wounded in the hospitals at the front, and is in many cases quite as important as surgery. The dentist is particularly valuable in event of serious wounds of the jaw and face, with which ordinary surgery is not well able to cope. Many a wounded man will return at the end of the war who would not have been in shape to show himself to his fellow-men were it not for the skilful work of the army dentist, assisted by modern plastic surgery. As a consequence of the war being waged largely in the trenches, many of the injuries are to the head, and frequently it is the jaw that is affected. This is due largely to the fact that the head only is exposed in this mode of fighting. A soldier shot in the head, with a penetration of the brain, usually dies, but if the face area alone is penetrated he usually lives, the probable extent of the injury being a fracture of the bones of the upper or under jaw. It often happens that the most distressing pain which a soldier endures after receiving a severe wound in the face is due to exposed nerves, and the dentist can most readily give him relief through treating it.—*The World Window*.

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TORONTO, APRIL, 1916

No. 1

EDITORIAL

What Is Unprofessional Conduct?

AT the recent meeting of the Royal Medical Commission, appointed by Order in Council of the Government of the Province of Ontario, the power of the Medical Council to discipline the members of the medical profession came up for serious discussion, and incidentally some criticism from one or more dissatisfied members. This is but one of the periodical upheavals that have marked the progress of professional standards, which have been maintained largely through the disciplinary powers granted to the governing bodies of the several professions.

It might not be amiss, at such a period, for the dental profession to examine its legal armor for possible vulnerable points. As one of the younger professions we have been treated most amably by the Legislature of Ontario, at least, and as a result are, comparatively speaking, in a fairly sound position in our relation to the members of the profession and the public. However, if we have one unsatisfactory spot, common to most of the professions, it is in the matter of dealing with certain cases of "unprofessional conduct."

Not that the power granted by the Legislature to discipline the members is too meagre or too weak, but that the college has failed to take full advantage of its power and place in plain language in its by-laws the proper interpretation of unprofessional conduct. As it stands at present, such interpretation is left largely in the hands of the presiding judge.

The words "unprofessional conduct" may mean much or may mean little according to the dental education and personal opinion of the court. The question of what class of conduct by a professional man comes under the head of "unprofessional conduct" should not be left to be interpreted by the different courts, but should be so specified as to leave no loop hole for escape.

Some of the dentistry acts through the by-laws, passed under statutory authority, boldly and definitely state the grounds upon which a license may be suspended or revoked. The Province of Quebec has decidedly the lead in Canada in at least this one particular, and have been wise enough to set out in detail the individual misdemeanor and misconducts that are declared to be "derogatory to the honor and dignity of the dental profession, and therefore breaches of discipline." Quebec has seen fit to imitate an ancient and venerable law, and has arranged this particular by-law in the form of Ten Commandments; and whilst she may, by being so specific, have omitted a few items, yet we feel sure if these ten commandments specified in her by-law are properly enforced, the members of the profession in Quebec will be walking the "straight and narrow way."

But the important point is, that the interpretation of "unprofessional conduct" is not a matter that should be undertaken by any one province apart from the other provinces. Surely this is a matter that the whole profession in Canada should be able to agree upon. What is "unprofessional conduct" for a dentist in Ontario or Quebec is just as surely unprofessional conduct for a dentist in British Columbia or Nova Scotia. Then why not have an interpretation of this troublesome and vague phrase, that will be a standard for the regulation of the profession from the Atlantic to the Pacific? The courts would certainly welcome such a simplification of obscure clauses, and an added strength would thus be given to the governing bodies of dentistry in the different provinces in any prosecutions that might occur.

The Dominion Dental Council might render valuable service in such a matter. The council has already done splendid work in unifying the Canadian dental profession and in raising its educational and academic standards. Here is an opportunity for another forward move.

Dental Disease and Diet.

¶ Exclusive of Dental Caries, Digestive Diseases have increased 103 per cent. within the past thirty years. It would be illuminating to know what the percentage increase would have been had dental disease been included.

¶ All digestive diseases, including dental lesions, are to be ultimately controlled through sane and scientific diet.

¶ People are nowadays said to "dig their graves with their teeth." The sooner people are educated to "eat their way back to health" the better.



FREDERICK LESTER STANTON, D. D. S.
New York City

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, MAY, 1916

No. 5

Dental Surveying and Arch Predetermination—New Evidence in Favor of Early Treatment

FREDERICK LESTER STANTON, NEW YORK CITY.

IN preparing an article for ORAL HEALTH, the author would refer the readers to the following data for a better understanding of the material that will appear in this paper.

At the International Congress at San Francisco, a paper was presented describing an instrument for surveying the dental apparatus by means of orthographic projections.

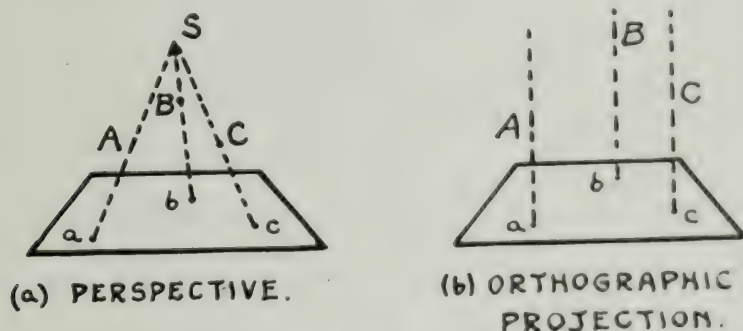


FIG. 1.

Fig. 1 shows Orthographic Projections and Perspective. In (b) the points A, B, C are projected in straight parallel lines to the drawing plane and appear at (a), (b) and (c). While in perspective, the points A, B and C appear on the drawing plane at

(a), (b) and (c), the eye of the observer being at "S," in the orthographic projections the eye of the observer is at infinite distance in the direction of the parallel projected lines.

In the May issue of the *International Journal of Orthodontia* will appear an article with the description of a complicated case, showing maps of malocclusion and a predetermined arch into which these teeth should be moved. In the original paper the possibility of determining the arch was viewed from the mathematical viewpoint, but since the publication of that paper, Mr. Gilbert Dudley Fish has invented an instrument (The Occlusograph) which will determine mechanically the arch of any given case. This instrument will be shown at the New York State Society at Albany on May 11, 12 and 13, 1916, and will presumably be described in the *Dental Cosmos*. In order that this paper may be of interest and benefit to the profession, it is proposed that some of the benefits of this method be outlined in relation to specific type of cases: malocclusions of deciduous and mixed dentures—cases between the age of five and eight. The following technique has been followed in reaching these deductions:

The models have first been surveyed and the position of the teeth mapped, the final map showing the relations of the upper and lower teeth. By means of the occlusograph the arch for each case has been determined and a map made of the occlusion. By sliding the map of occlusion over the map of malocclusion, a position has been selected that requires the least tooth movement to move the teeth from malocclusion to occlusion.

In surveying a number of cases of malocclusion, the author was forcibly struck by the following facts: namely, that the arch was generally too narrow; that the lower incisors keep very nearly their normal positions; that the upper incisors were generally flaring outwardly, their incisal edges being too far forward.

In taking very young cases, that is, previous to the eruption of any permanent teeth, it was found that the greatest fault appeared to be in the narrowness of the arch in the region of the temporary molars, especially of the second temporary molar. In observing a case at a little later period at the time of the eruption of the first permanent molars, these teeth seemed to take more nearly their correct positions at the time of their eruption, but in order to make contact with the end of the deciduous arch, which we have noted is too narrow, the mesial ends of the first permanent molars rotate lingually to make contact with the narrow temporary arch (Fig. 5a and 5b).

While the first permanent molars often require expansion to put them in their proper positions, still we can say that the arch is, as a rule, more nearly normal at the first molar than in the region of the second temporary molar. In examining a series of cases at the 12th year, it was found that no matter how much the arrest of development was in the anterior part of the arch (even where there was extreme narrowness in the first molar and bicuspid region) the second

permanent molar was able, in most cases, to assume a correct position in the width of the arch; in other words, the vast bulk of malocclusions consists of too narrow arches in the deciduous set. As the palate grows to accommodate the first, second and third permanent molars, it becomes more normal in width in the region of the first permanent molars and generally correct in the region of the second and third molars. While we have found exceptions, these facts are presented to focus attention to the point that malocclusion of the teeth is a deformity primarily of the temporary molars and later of the permanent bicuspid.

Inasmuch as the medio-distal diameters of the four temporary incisors are about on the average seven millimeters less than the permanent incisors, it follows that if the lateral halves of the temporary arch are too narrow and there are no spaces developed between the temporary incisors, the permanent incisors cannot take their proper positions at the time of their eruption. The lower incisors, especially the centrals, assume in most cases a very close proximity to their correct positions, and the laterals, not having sufficient spaces, are usually situated lingually to their normal positions.

In the eruption of the upper incisors, we have, as a rule, a flaring outward of the incisal edges, and a crowding and consequent rotation of these teeth. As a result of surveying and predetermining arches, this picture has become so firmly implanted in the author's mind that it would seem that all malocclusions form more or less a common picture, and that the logical procedure would be in treating these cases and restoring them to their normal arch-form and occlusion, to first place the side teeth—molars and bicuspid—on their correct width and curvature, and then attend to the anterior part of the arch. In the papers on this subject, we have pointed out that the form of any dental arch is dependent on the tooth material, or better, the inter-relation of the sizes and forms of the teeth of that individual. In other words, in occlusion we have definite bodies, the teeth, and it is known that certain points on these teeth must fit with definite points of the teeth of the opposite jaw, and that the teeth have a definite arrangement among themselves; that is, individual teeth have contacts that must make contact with their neighbors so that this definite mechanical relation that each tooth bears to the other teeth and to the whole arch, accurately determines the position those teeth must occupy to be in normal occlusion. To better illustrate this, the following drawing (Fig. 2) is made of an individual having upper incisors—centrals, 9.0 millimeters, laterals 7.0 millimeters, and on the lower, central 5.6 millimeters, laterals 6.1 millimeters and cuspids 6.6 millimeters. In Fig. 2 (b), the teeth are arranged in a proper curvature to produce occlusion. It will be noted that the summit of the cusps of the lower cuspids have occluded between the upper lateral and the cuspid.

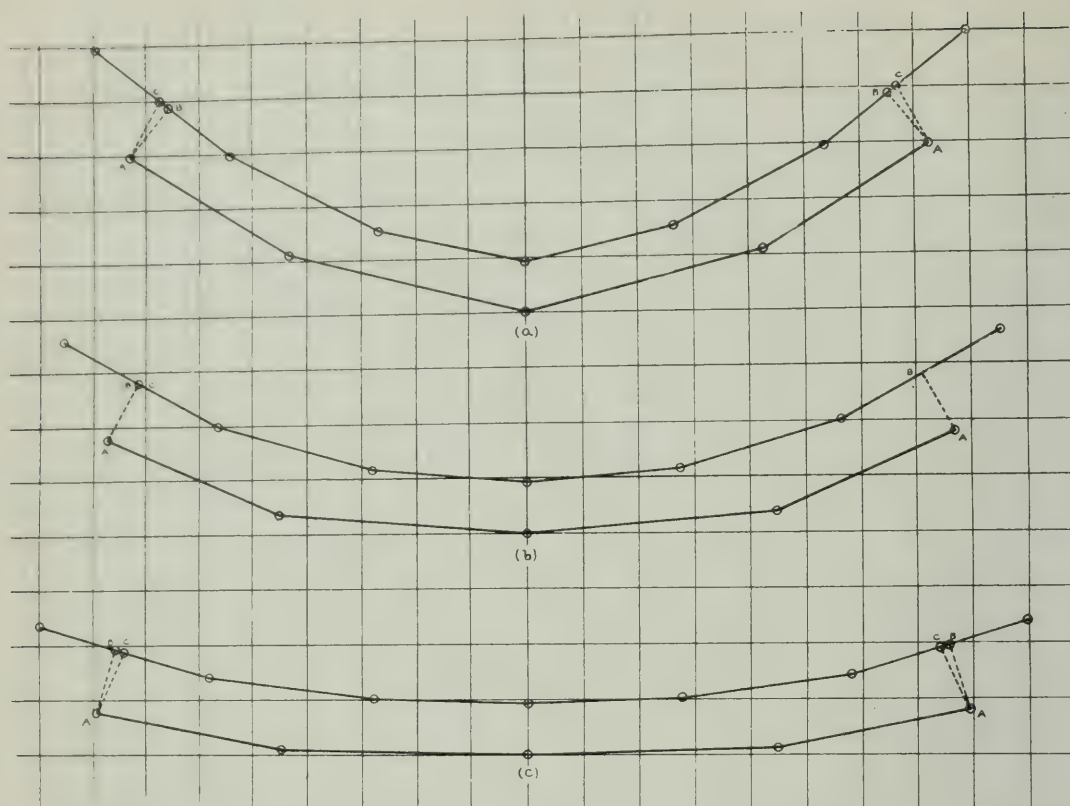


FIG. 2.

In Fig. 2 (c), a curvature has been selected that is too flat for this individual, and it will be seen that the lower cuspid is unable to reach its position in occlusion, and the summit of the cusp is mesial to its normal position in relation to the upper.

In Fig. 2 (a), an arch that is too narrow has been selected and a curvature that is too sharp in the front, and in this case we are unable to get occlusion as the lower tooth material stretches too far in relation to the upper, and the lower cuspid is seen to occlude distally to its normal position. From this it will be seen that the occlusion of the teeth depends upon the inter-relation of the tooth sizes and forms, and that the Orthodontist, in taking a case of malocclusion, must realize that in order to predetermine the arch of any given case, he must in some way test the relations of these teeth to each other and find out if occlusion can be produced, and if it can, what form the dental arch will assume when this individual's teeth are placed in their best relations to each other.

By a careful study of Fig. 2, it will be noted that in these three plans (a), (b) and (c) of an arch, that the distal contacts of the upper laterals and the lower cuspids change their positions (as shown by the squares they occupy) a great distance, while their occlusal relations are only slightly disturbed. The necessity of selecting a

proper width for bicuspid and molars is graphically shown by this figure if the reader appreciates how much the width and curvature of the side teeth influence the position and direction of the mesio-distal contact line of the lower cuspid as shown in (a), (b) and (c).

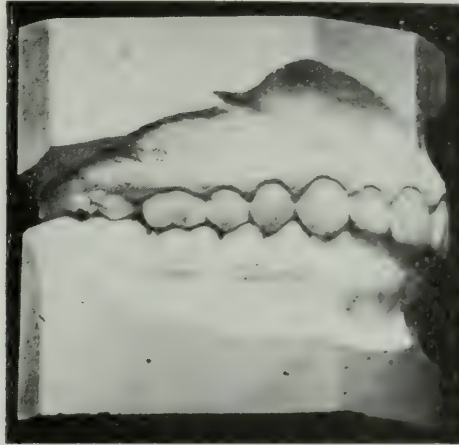


FIG. 4A.

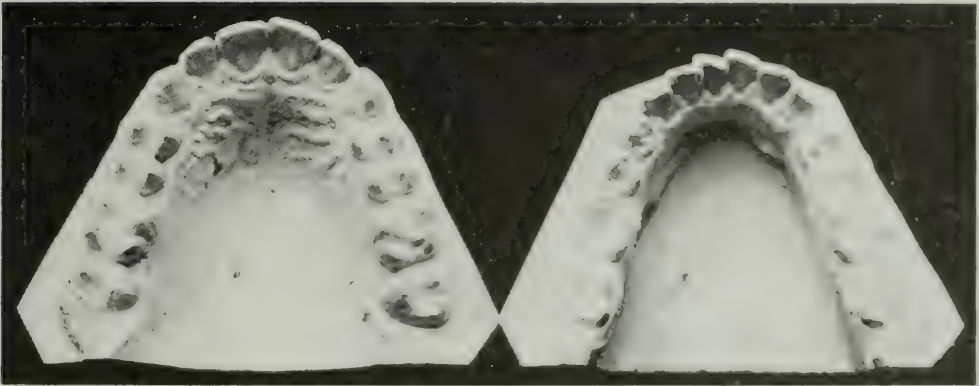


FIG. 4B.

This principle is well shown by examining Figs. 4 (a) and 4 (b), which are models of a treated case where a mistake has been made in selecting the correct arch-form to produce occlusion.

In Fig. 4 (a) we have a good relation of the side teeth with a space between the incisors. In Fig. 4 (b) we note the crowding and overlapping lower incisors. It follows that this arch is too narrow in the bicuspid region. When an arch that is too narrow is selected, the result will be either a good relation of side teeth with overlapping lower incisors or a good relation of the upper and lower front teeth with an end to end relation of the side teeth. *When this principle is thoroughly understood, the use of inter-maxillary elastics will become greatly diminished.*

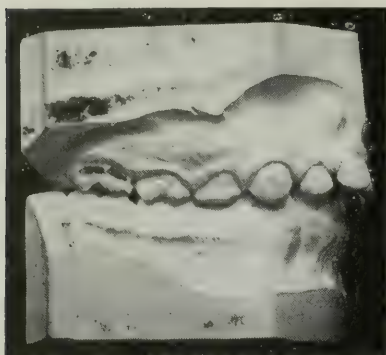


FIG. 5A.

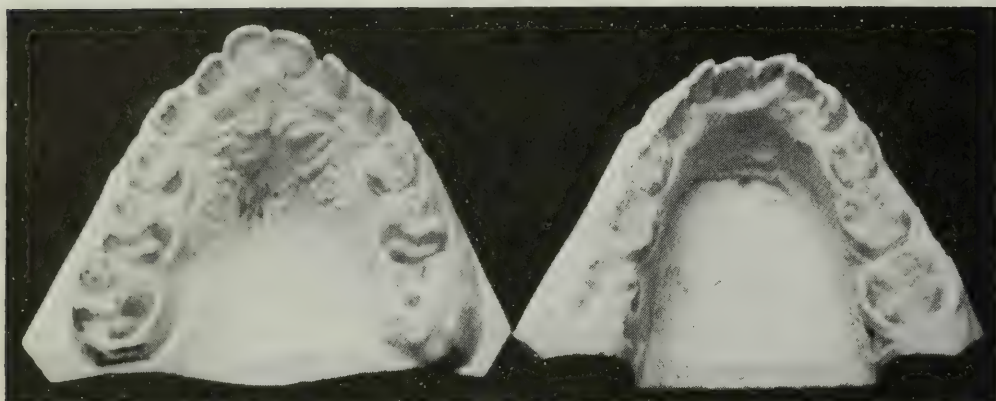


FIG. 5B.

Fig. 5 (a) and 5 (b) has been selected to show the method of surveying and predetermining a mixed denture in malocclusion. The plan adopted has been to make maps of the malocclusion and to make maps of the proposed occlusion and by sliding the maps of occlusion over those of malocclusion, to select a position that will restore the teeth to occlusion with the least tooth movement.

FIG. 3.

In Fig. 3 (a) the upper teeth are in red and the lower in black (the molars are surveyed on the summit of the cusps and connected). Buccal and lingual grooves are shown; (b) occlusion; (c) upper jaw, malocclusion in black, proposed positions in red; (d) lower jaw—the black to be moved to red; (e) upper gum line in black as surveyed from original model; red, finished gum lines when occlusion is established; (f) lower gum lines—the red moves to the black.

In conclusion, the author wishes to make a strong plea for the early treatment of malocclusion for the following reasons:

First, as the principal arrest of development comes before the eruption of any permanent teeth and is most markedly shown in the width of the dental arch in the region of the temporary molars, it is most disastrous to the permanent denture to leave the temporary denture untreated for the reason that the first permanent molars on eruption seek mesial contact with the deformed deciduous teeth.

Secondly, as the incisal portion of the permanent arch contains teeth that are, on the average, seven millimeters larger than the temporary incisors, therefore the great deformities and disfigurements of the permanent denture are made by not moving the temporary denture into normal curvature so that the incisal teeth will erupt normally.

Thirdly, as has been pointed out by many other writers, by moving the lateral halves of the temporary denture, the germs of the permanent teeth contained between the roots of the temporary molars are moved to their correct position by the application of force to the temporary teeth. A fault has been in tying the lower incisors forward in an arch that is too narrow and too long for that individual. This fault is aggravated by retaining the lower incisors by means of lingual retaining appliances. On removal, the lower incisors would drop back and break contact with the upper arch. In this plan of treatment, the lateral halves of the arch will be moved into their correct curvature, permitting the *incisors to erupt into their normal positions*. Without retention they should remain in these positions.

The next great advantage in treating the dental apparatus at this early age is the fact that the temporary denture is very nearly on a plane and that the appliances placed on the temporary teeth do not disturb this plane if the teeth are moved bodily. While the first upper permanent molar in its eruption has considerable vertical curvature, and as the permanent denture evolves, the curvature is constantly changing until the completion of the permanent denture. When the occlusion has been completed there is a slight upward curvature of the upper first molar. For this reason it is unwise to attach to the first permanent molar as it erupts and fix it rigidly with appliances that interfere with this changing vertical curvature.

By applying force to the temporary denture by means of attachments to the temporary molars, we correct the tendency of the first permanent molar to erupt into too narrow an arch and we do not interfere with its vertical curvature, which is continually changing normally. Progress surveys can be made from time to time and compared with the original maps of occlusion and malocclusion.

Last Instalment of Dr. Cummer's Article.

UNFORTUNATELY, it has been found impossible to continue Dr. Cummer's article, "Partial Dentures," in this issue. Arrangements have been made, however, to conclude the article in the June issue.

The Sterilization of Dental Instruments.*

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THE possibility of the transmission of disease from one person to another through the medium of instruments and appliances used in dental operations has long been recognized. Reports of such occurrences are frequently heard from the laity, but authentic reports in scientific publications are practically never published. Few men will deny that such cases do occur occasionally; their frequency, however, is not determinable.

Anyone familiar with asepsis has probably noticed errors in the surgical technique of a dentist while receiving dental treatment. Among these errors may be mentioned the placing of sterilized instruments on a swinging tray or glass plate which has not been sterilized, the cleaning of burrs on a scratch wheel which has not been sterilized since the burrs used on the previous patient have been cleaned thereon, and the frequent handling of the cable of the dental engine, which receives contamination from one patient through the operator's hands and in turn returns a portion of this contamination to the operator's hands when used on subsequent patients. These are some of the errors of technique seen personally, and are mentioned here to emphasize the necessity of having everything which comes in contact with the instruments or hands of the operator free from organisms obtained from previous patients in order to prevent transmission of infection from one patient to another.

A sterile towel over the tray, a scratch wheel which can be removed and sterilized with the instruments, and a simple sterile linen covering to put over the cord of the engine would make the operation many time more acceptable to the critic, provided, of course, a fresh towel and covering were used for each patient and the scratch wheel sterilized when each patient vacates the chair.

For improvement of the technique of the future dentists we should look to the dental schools. They all have courses in bacteriology, which, however, in many schools are largely theoretical instead of practical. The morphology and cultural characteristics of various organisms are considered, but their resistance to disinfectants is passed over by noting what certain books say regarding this phase of the subject. Little actual laboratory work is done to show the relative value of the sterilizing agents applicable in dentistry and how their efficiency is tested. As a result the student forms the opinion that any sterilizing agent is effective, and does not learn to check his sterilization by bacteriological tests. For the coming dentists the improve-

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ment should come through the schools. For those already in practice it must come through reading and exchange of ideas among the men of the dental and medical professions.

Realizing the necessity of improvement, some members of the dental profession are striving to bring about better sanitary conditions in the offices of dentists at large; also among their patients, by teaching them oral hygiene. This work is most commendable, and to this end the officers of some dental societies have asked the Surgeon-General of the Public Health Service to work out a detailed method for sterilizing dental instruments and appliances, keeping in mind the important factors, simplicity, efficiency, and duration of the process of sterilization. As a result of this request the writer was designated by the Director of the Hygienic Laboratory to consider the matter, make experiments, collect data, and make a report thereon.

The progress of the work has been interrupted frequently by exigencies of the service and the report much delayed as a result.

THE STERILIZATION OF DENTAL INSTRUMENTS.

In considering this subject the writer has endeavored to keep within practical bounds rather than to pose as an idealist.

In testing the efficiency of various methods of sterilization of dental instruments, the consideration of spore-forming organisms has been disregarded. A high degree of heat for a prolonged period is required to kill the spores of spore-bearing pathogenic organisms. Fortunately, the number of such organisms is comparatively few. The vegetating forms of these organisms are killed as easily as are the non-spore bearers. The spore represents a defensive element of the organism against unfavorable influences; that is, though capable of becoming alive, it is apparently in a lifeless phase. Since it remains in the spore stage while in conditions unfavorable for its growth, the spore is easily removed from place to place by mechanical means, thereby increasing the chance of finding a more suitable environment.

By reason of this fact mechanical means of removal of spores from instruments is relied upon. Mechanical cleansing of instruments by a brush or sponge, preferably in running water, will reduce the number of spores so that the number remaining will be too small to consider. For experimental data on the efficiency of mechanical cleansing in the removal of spores, the reader is referred to Francis (1).

Such organisms as the pus-producing cocci, the bacillus of typhoid fever, the bacillus of diphtheria, the bacillus of tuberculosis, the *Treponema pallidum* (syphilis), the bacillus of influenza, the amœbæ, and the thrush fungus, are known organisms that should be considered. To this list may be added the virus of diseases of unknown or uncertain origin, such as that of measles, scarlet fever, mumps, infantile paralysis, and smallpox, all of which seem to be caused by non-spore-bearing organisms.

Of the non-spore-bearing organisms, the staphylococci are reported to be the most resistant to heat, our most efficient disinfecting agent. On this account various strains of staphylococci were used as the test organisms in the experiments made in connection with this investigation.

Table I.—Showing thermal death point of various organisms according to different authorities.

Authority	Influenza	Staphylococcus aureus	Streptococcus	Pneumococcus
Sternburg (2).....	60°, 5 minutes....	{ Moist, 58°, 10 minutes. Dry, 100°.....	{ 54°, 10 minutes..	52°, 10 minutes
McFarland (3).....	.....	{ 62°, 10 minutes.. 80°, 1 1-2 minut's	{ .....	.....
Muir and Ritchie (4)...	.....	{ 80°, 30 minutes.. 80°, 5 minutes....	{ .....	.....
Park and Williams (5)...	60°, 5 minutes....	{ 58°, 10 minutes.. Dry, 90 to 100°..	{ 54°, 10 minutes..	52°, 10 minutes
Hiss and Zinsser (6)....	60°, few minutes..	{ 80°, 30 minutes.. 62°, 10 minutes..	{ 54°, 10 minutes..	52°, 10 minutes
Jordan (7).....	.....	{ 62°, 10 minutes..	{ 54°, 10 minutes..	52°, 10 minutes
Abbott (8).....	.....	{ .....	{ 54°, 10 minutes..	52°, 10 minutes
Rosenau (9) (10).....	60°, 10 minutes....	{ .....	{ .....	.....

Authority	Meningococcus	Typhoid	Diphtheria	Tubercle bacillus
Sternberg (2).....	.....	56°, 10 minutes..	58°, 10 minutes..	70°, 10 minutes
McFarland (3).....	.....	60°, 10 minutes..	58°, 10 minutes..	60°, 20 minutes
Muir and Ritchie (4)...	.....	60°, 30 minutes..	60°, 10 minutes..	70°, 1 hour
Park and Williams (5)...	Readily	60°, 1 minute....	60°, 10 minutes..	80°, 1 minute
Hiss and Zinsser (6)....	{ Extr'm'ly sen- sitive to heat {	56°, 10 minutes..	58°, 10 minutes..	{ 60°, 20 minutes 80°, 5 minutes
Jordan (7).....	.....	.....	55°, 45 minutes..	60°, 20 minutes
Abbott (8).....	.....	60°, 10 minutes..	58°, 10 minutes..	{ 80°, 5 minutes 65°, 15 minutes
Rosenau (9) (10).....	.....	60°, 20 minutes	Less than typhoid	60°, 20 minutes

Table I. shows the thermal death point of various organisms, according to different authorities on bacteriology. It was found that the stock laboratory cultures of staphylococci were much less resistant than strains of the same organism obtained from human beings. For this purpose smears from cases of suspected diphtheria or from cases of tonsilitis were used, thereby getting organisms similar to those encountered in the mouth. Mixed cultures were used to simulate the conditions found in nature. In a few cases, *Bacillus subtilis*, a non-pathogenic spore-forming organism was encountered.

The resistance of the staphylococci was also tested, when dried on instruments prior to sterilization and when not dried. The resistance was always greater when the contaminated instruments were dry. Consequently the dried infectious material was used in most of the tests.

The physical processes involved in sterilization have been the subject of much research and discussion. It is not necessary to consider here to any extent the theories. They can be stated briefly as the coagulation and hydrolytic theories. The first strives to show that the cell substance of the organism is coagulated by the disinfecting agent, just as the white of an egg is coagulated by heat when cooked. The second theory claims that the death of the organism is brought about by the introduction of water into the cell substance, the conse-

quent hydrolysis being accelerated by the disinfecting agent.

The process of sterilization has been described by Phelps (11) as an increase of the death rate of organisms. But in determining the result of this process there are three factors to be considered, viz: (a) The velocity of the death rate of the organisms; (b) the time through which (a) is allowed to proceed; (c) the number of organisms present. The product of these three factors gives the result. Sterilization is, therefore, a relative result from a mathematical viewpoint and is usually arbitrarily recorded as perfect when the number of bacteria in the volume tested is less than one. On this death rate of organisms, the number present, and the time allowed, depend the efficiency of a sterilizing agent.

However, the exact mode of killing the organisms does not interest the practising dentist and surgeon so much as does the assurance that all will be killed, in some manner, under certain conditions.

The methods of sterilization employed at present in most dental offices may be classified as follows:

Thermal	Boiling in water.	Chemical	Carbolic acid, followed by alcohol.
	Use of boiling water.		Other coal-tar products, followed by alcohol.
	Passing an instrument through a free flame.		Formaldehyde vapor in a tight chamber.
	Moist heat in a closed or open chamber.		Other chemicals, such as gasoline, solution of biniodide of mercury.
	Dry heat in a closed chamber.		

The efficiency of most of these methods was tested, and the advantages and disadvantages of each considered.

BOILING IN WATER.

Results of experiments.—Most authorities state that non-spore-bearing organisms are killed by boiling for 10 minutes. A few have reported organisms of this class that have resisted boiling for 30 to 60 minutes, but such are of too infrequent occurrence to require consideration. Of the various strains of staphylococci in mixed culture, which I have tested, I have found none that survived three minutes boiling. This means exposure to water heated until noticeable ebullition takes place before the organisms are placed therein, the time being taken by the watch. Undried instruments were sterilized in two minutes. Sterility tests were made by dropping the sterilized instruments into tubes of nutrient bouillon and incubating these for 48 hours at 37°. Though my experiments show sterilization in a shorter time, a period of 10 minutes' boiling is recommended, to provide an ample margin on the side of safety. A small amount of alkali, such as sodium carbonate, or sodium hydroxide, should be added to the water to prevent rusting of instruments.

The advantages of this method are: (a) It is the most rapid and most efficient; (b) it is always available where fire and water can be

obtained; (c) the procedure is simple and can be carried out by any one; (d) the expense of sterilization by this method is small.

The disadvantages are: (a) Dulling of the sharp edge of cutting instruments, such as knives, lancets, etc.; (b) increase of effect of action of any chemical impurity in the water upon the instruments, a factor that will vary according to local conditions.

USE OF BOILING WATER.

Results of experiments.—If used immediately after the heat is cut off, and in quantity sufficient to guard against a rapid cooling, this method is nearly the equivalent of boiling, so far as practical results are concerned. The use of one gallon of water, boiled until the moment before the instruments are submerged in it, sterilizes as rapidly as does boiling, at least during the first five minutes of exposure. If care be taken to carry out this procedure fully, the method is efficient, the advantages and the disadvantages being the same as with boiling, save that the rapid cooling of the water will necessitate reheating to the boiling point to insure proper results.

The use of water of too low temperature or for too short a period of time makes possible incomplete sterilization. As the temperature is lowered the period of exposure must be lengthened; but, as the loss of heat is uncertain, the required length of exposure will necessarily be uncertain. On account of the uncertainty of the temperature of the water, except it be boiled immediately prior to use on each occasion, this method is not as good as boiling or the use of a *known* temperature at a degree lower than the boiling point.

PASSING AN INSTRUMENT THROUGH A FREE FLAME.

This method is effective, since, if properly carried out, it virtually amounts to incineration of the organisms. The degree of heat to which the instrument is subjected is much higher than the boiling point, and on this account only a few instruments can be sterilized by this method without interfering with cutting qualities, temper of steel, or plating of instruments. It is applicable to certain small instruments whose cost is not high, but is not available for general use.

MOIST HEAT IN AN OPEN OR CLOSED CHAMBER.

This is applied by the use of steam in an open chamber (Arnold) or in a tight chamber under pressure (autoclave). Its use for instruments is not very extensive, as the same results can be obtained by direct boiling and some time saved, since boiling a small amount of water requires much less time than heating up a large apparatus. It is of greatest value for sterilizing linens, gowns, towels, etc., and the steam under pressure is preferable, on account of its greater penetration.

DRY HEAT IN A CLOSED CHAMBER.

This method is not used for instruments, on account of the high temperature required and the long time required to carry it out. It can be used for glassware or for sterilizing linen, if the temperature be not too high.

USE OF CARBOLIC ACID FOLLOWED BY ALCOHOL.

This method consists of submersion of the instruments in phenol of varying strength. The solubility of phenol in water is about 1 part in 20, giving a 5 per cent. solution. This solution is more effective than the pure phenol. After submitting the instruments to this treatment they are immersed in alcohol, to remove the excess of phenol, and may then be rinsed in water, or used without rinsing.

Results of experiments.—With many strains, 10 minutes' exposure to 5 per cent. phenol, followed by one minute in alcohol, sufficed to sterilize. Some strains of staphylococci, however, were more resistant and uniformly gave growth after 15 minutes; in a portion of the tubes even after 30 and 45 minutes' exposure. No strain used survived one hour in 5 per cent. phenol. The same resistant strain was uniformly killed by boiling for three minutes. It was also killed by three minutes' exposure in an 80° water bath.

Its advantages are: (a) The cost is moderate; (b) it can be applied to practically every instrument and appliance without damage resulting therefrom.

Among its disadvantages are: (a) It requires a longer period of time to sterilize; (b) it requires more care in the application of the method (care must be taken to see that all surfaces of instruments are exposed to the solution); (c) instruments must be removed from phenol by forceps, as the solution has a bad effect on the skin if the hands are used in it frequently; (d) it requires a much better trained assistant, or the attention of the dentist himself, to use this method properly; (e) the odor of phenol is, to some, objectionable.

The use of other coal-tar products resembles that of phenol in application and efficiency. The advantages and disadvantages mentioned under phenol apply also to these products, except as follows: (a) Some have a higher co-efficient than phenol; that is, they are more germicidal than phenol; (b) some have a soapy composition, giving them the cleansing property of soap when mixed with water; (c) their cost, however, is in most cases considerably greater.

FORMALDEHYDE GAS IN AN AIR-TIGHT CHAMBER.

This method has, of late years, been very popular among dentists and is efficient, provided a sufficient length of time is allowed for action.

Results of experiments.—Exposure of contaminated instruments to formaldehyde vapor in an air-tight glass jar for periods varying from

10 minutes to one hour gave growth more or less constantly. Some strains of staphylococci were always killed by 30 minutes' exposure; the more resistant strains survived for 60 minutes. An exposure of one and one-half to two hours killed the most resistant strain used. These results were obtained with an excess of formalin in a small glass jar closed by ground-glass joints sealed with vaselin, so the air was filled to saturation with the formaldehyde vapor.

The advantage of this method lies solely in its simplicity and ease of application.

Its disadvantages are: (a) The time required to sterilize is too long for a busy dentist; (b) formaldehyde causes quite a marked rusting of unplated steel instruments; (c) inefficiency is likely to result from the lessening of the density of formaldehyde vapor, unless special care be taken to replenish the supply of formalin solution at frequent intervals; (d) inability to remove a single instrument from the airtight chamber without interfering decidedly with the process of sterilization, because of the lessening of the density of the formaldehyde vapor in the chamber; (e) the disagreeable odor and irritating effect on mucous membranes will be experienced more or less by both operator and patient.

OTHER CHEMICAL METHODS.

Disks containing mercuric iodide with some alkaline salt are theoretically practicable. The alkalinity is supposed to guard against the corrosive action of the mercury on the metal instruments. However, this brings a rather delicately balanced chemical reaction into use, and unless the application of the method be carried out by the dentist himself, or an assistant who has some knowledge of chemistry, bad results may be obtained. For instance, the chemical impurities of the water used may vary from day to day, and thus disturb the proper degree of alkalinity. No experiments were made with these disks, as it is not conceivable that their use is an improvement on some of the simpler and less technical methods.

The action of various chemical substances, such as gasoline, petroleum-ether, etc., was tried by the writer. Their efficiency is doubtful and uncertain. No sterilization was obtained except on prolonged exposure (24 hours or more).

In addition to these methods the writer tried the application of moist heat at a constant degree, lower than the boiling point; 80° was the temperature used. This was tried in order to get a method that would interfere less with the edge of cutting instruments than does boiling; also, a method that could be applied to certain instruments that could not be boiled without marked deleterious effect on them, such as dental mirrors.

A jacketed water bath, designed by Mr. W. F. Wells, which was equipped with an apparatus for maintaining a constant level of water in the jacket, was used for this purpose. The inner chamber contains

a thermoregulator set at 80°. In this bath the contaminated instruments were placed for varying periods.

To alkalinize the water, 0.25 per cent. sodium hydroxide was added. When once raised to 80°, the amount of gas or electric current required to maintain a bath containing one to two gallons is very small, indeed. In fact, it can be maintained at that temperature for the whole 24 hours cheaper than it can be extinguished and reheated each day.

The use of this degree of heat had no deleterious effect on metal instruments or dental mirrors after prolonged and repeated exposure. Sterilization was always obtained in three minutes, even with the most resistant strains of staphylococci used. It is thus seen that this is practically as effective as boiling, but the temperature is 20° lower. It is simple to operate when once installed and is very efficient and rapid.

As stated above, no bad effects were noted on dental mirrors or instruments. However, there was a bad effect on instruments with wooden or hard-rubber handles. In the present era, however, no instrument that is not entirely of metal has any place in the armamentarium of surgeons or dentists. There are a few exceptions to this rule, where flexibility or elasticity is a factor in the use of the instrument.

From the above experiments and considerations the methods depending upon moist heat were found to be by far the most rapid and efficient.

In order of merit the writer places the methods depending upon heat as the active disinfecting agent as follows:

1. Boiling for at least 10 minutes in 0.25 per cent. sodium hydroxide.
2. Use of water bath at 80° for at least 10 minutes.
3. Use of moist heat in free chamber (Arnold sterilizer) for at least 10 minutes after thermometer reaches 100°.
4. Submersion in boiling water for at least 10 minutes, the source of heat being removed immediately prior to submersion of the instrument.
5. Application of dry heat by passing instrument through a free flame.
6. Dry heat in closed chamber.

The arrangement of the chemical methods in order of merit is much more difficult; in none are simplicity, efficiency, and rapidity combined as in some of the methods dependent on heat.

Using formaldehyde, the simplicity is ideal; but the length of exposure necessary to gain efficiency makes it undesirable. With phenol and other coal-tar products efficiency is good but simplicity and rapidity are partially sacrificed. With mercuric iodide, the same factors that militate against phenol, plus a possible deleterious action on the instruments, are applicable.

It is the opinion of the writer, therefore, that in selecting a method for adoption in dental offices the use of moist heat is essential. Some will offer the objection that a dentist has many instruments which will

not stand such procedure. I will admit that there are, perhaps, a few instruments which can not be boiled without an injurious effect on them; but after eliminating hard rubber and wood handled instruments, which have no place in any instrument case of the present age, this list becomes very small.

I shall now consider the method of choice as applied to different instruments.

The instruments in the following list can all be boiled without marked bad effects unless the water used has some special chemical impurity which attacks the metal. Such conditions will have to be determined for each water supply and the proper remedy sought through scientific channels.

Broaches and their holders.	Mouth gags.
Burnishers.	Mouthpiece of gas apparatus.
Burrs.	Mouthpiece of saliva ejector.
Chisels.	Pluggers.
Cone-socket instruments with metal handles.	Polishing points.
Drills.	Pyorrhoea instruments.
Excavators.	Root elevators.
Explorers.	Rubber-dam clamps, and forceps for the same.
Files.	Rubber-dam holder (metal parts) and weights.
Forceps, extracting.	Saws.
Forceps, foil.	Scissors.
Forceps, tongue-holding.	Scalers.
Impression trays.	Spatulas, metal.
Knives and lancets.	Syringes, water.
Mallets, automatic and hand.	Syringes, hypodermic.
Mixing slabs.	

The latter should be of glass or metal without washers; they can then be boiled repeatedly without impairing their efficiency in any way. An inferior hypodermic syringe is always unsatisfactory, whether it be sterilized or not.

To the above list I will add the following as instruments that will stand boiling:

Chip blower.	Wire scratch wheel for head of dental engine.
Masks for giving nitrous oxide gas.	Engine hand pieces.

The wire scratch wheel on the head of the dental engine should be made entirely of metal and detachable, so that it can be easily removed and boiled. Probably a cheap bristle wheel might be made that could be discarded after each patient is treated.

Probably many will challenge the statement that engine hand pieces can be boiled. This statement is made only after having procured a right-angled hand piece, boiled the same, and tested its sterility, then contaminated it with a fluid culture of bacteria, and again boiled it and tested its sterility. After completing the experiments with it for the day it was placed in 95 per cent. alcohol to remove the excess of water, and in several instances left in this fluid

overnight. It has been boiled repeatedly and frequently exposed to 80° in a water bath, yet it has shown no bad effects as a result of such treatment, except the removal of the lubricant from the mechanism. It can be oiled in a few seconds and its mechanism will run as smoothly as before. These hand pieces could be made with oil holes at the proper points so that the oiling would be much facilitated.

This instrument is one which dentists have usually considered non-sterilizable, consequently it has received very little efficient sterilization. Marshall (12) states that hand pieces can be sterilized by immersing them in gasoline and then in alcohol; but my experiments with sterilization by anhydrous liquids have given disappointing results, even with instruments of simple construction. Furthermore, the effect of gasoline and alcohol on the lubricant will be practically as complete a removal of the oil as when boiled, so that oiling of the piece would be necessary after each sterilization.

In sterilizing hand pieces, heat will reach infection in parts of the instrument where cold solutions can not be effective, on account of the oil present, and where gas does not penetrate. With heat, the metal itself is raised to the temperature of the surrounding medium, so that the organisms are attacked from all sides; while with solutions or gases more or less of their surface is protected.

In seeking a method of sterilization for hand pieces, several methods were tried, designed to obtain sterilization without the introduction of water into the instrument. As stated above, the gasoline method did not sterilize rapidly and completely. Immersing in a fixed oil, liquid vaseline was then tried, placing this in a steam chamber and raising the temperature to 100° for one hour. This proved inefficient, because the heat is only the equivalent of 100° of dry heat, the instrument being in an anhydrous fluid. As a last resort I turned to moist heat by the method of boiling, or an 80° water bath, in 0.25 per cent, sodium hydroxide and then removed the excess of water by absorbing it with alcohol. This gave the desired result.

All of the above mentioned instruments may be submitted to 80° in a water bath without any injurious effect on the instruments. Mouth mirrors may also be sterilized by this method without injuring them. This was determined by obtaining several new mirrors, contaminating them, and then placing them in 0.25 per cent. sodium hydroxide solution at 80°. Sterilization was accomplished in three minutes, though the mirrors were frequently left in the bath for a much longer period, 10 to 60 minutes. The test of the effects of this treatment was made by handing the sterilized mirrors, together with a new mirror of the same lot that had not been sterilized, to other persons and asking them to pick out the one that had not been sterilized. Everyone acknowledged his inability to determine any difference.

Boiling, or heating to 80°, the rubber bulbs of chip blowers, and the face piece of the gas inhaler, will shorten the life of these articles.

It is believed, however, that the increased expense, due to these rubber fittings, will not be great enough to work any hardship on the dentist. It certainly will not be as great as the cost of rubber gloves used by the average surgeon; and at present nearly every surgeon uses rubber gloves and insists on their sterilization by boiling. The dental surgeon should not be content with a lower grade of work, nor deterred by the small sum necessary to replace articles which have been worn out a little sooner by reason of improved methods in his practice.

The instruments considered above, which can be sterilized by boiling, include the greater portion of those used by the dentist; except those whose cost is so slight, or whose usefulness so impaired after using once, that they can be thrown away.

This list includes:

Polishing points and disks.

Rubber dam.

Nerve broaches (these may be sterilized by heat if desired).

Bristle brushes.

Mounted stones must be treated according to their construction and composition. Carborundum disks, wheels, and stones, which are bonded with porcelain, can be boiled without injury. Those made with rubber as the adhesive base can not be heated. Their sterilization can be accomplished by use of a phenol solution followed by alcohol. Corundum stones can not be boiled, so the phenol solution should be used on these. Stones mounted on a mandrel by a cement or shellac can not be subjected to heat, while those mounted by metal devices can be boiled, provided their composition allows such treatment. Inasmuch as many of the stones and disks must be sterilized without heat, it is permissible to sterilize all stones by immersing in 5 per cent. phenol solution for one hour, to be followed by immersion in alcohol to remove the excess of phenol solution.

Tortoise shell, and instruments of similar composition, which might be injured by heat, should be immersed in phenol solution, as are mounted stones. Mouth mirrors may also be sterilized in this manner, if not subjected to 80°.

The life of a mouth mirror, however, depends entirely on the efficiency of its construction in keeping fluids of any kind from the amalgam surface of the glass. As long as this can be kept dry the mirror is clear. When it becomes wet by any fluid, either water or saliva, it becomes cloudy, consequently a well-constructed mirror is the cheapest in the end.

This method may also be applied to instruments whose composition must be other than metal, on account of the discoloring effect of metal on cement, or for other good reason.

However, barring the few instruments whose chemical composition is such that a serious change in character would result from

heating, all instruments should be sterilized by heat, and no instrument made of material that is destroyed by heat should be allowed in the instrument case, if the same instrument can be made of thermostable matter.

I have seen some dental instruments with rubber handles which have been boiled repeatedly, with no bad effect except discoloration of the rubber. These, however, had a central metal shaft supporting the rubber, to prevent bending when heated. While this construction permits the boiling of rubber-handled instruments, it can not be said that rubber handles are as acceptable from an aseptic viewpoint as are all-metal instruments. Of course, instruments whose cost is so slight that they are used once and then discarded do not require sterilization to prevent transfer of infection from patient to patient.

OTHER SANITARY MEASURES.

The following suggestions relating to dental asepsis, while not strictly within the subject of sterilization of instruments, are given as contributory factors in improved office sanitation.

Cuspidors are a necessity in a dental office, and the problem of keeping them in sanitary condition is a difficult one. The installation of the fountain cuspidor has been a great improvement over the old metal or earthen bowls which were so hard to keep clean. To those dentists who still have the old type of cuspidor, on account of lack of running water or for other reason, I would recommend at least daily cleaning, with a broom or stiff brush and water. This is to be followed by placing the cuspidor in a bucket, covering it with boiling water, and leaving it there for at least one hour. It would be well to have several of these, so that a clean one can be put in use for each patient while the others are being cleansed by assistants or charwomen. In offices having the single-bowl fountain cuspidor, with bowl that can not be removed, flushing with hot water and antiseptic solutions is our main effort in sterilization. All fountain cuspidors should be fitted with both hot and cold water, so that the hot water can be used for cleaning the bowls after each patient is dismissed. Those having bowls that can be removed can have the bowls immersed in antiseptic solutions, or may even be boiled in a large container. However, absolute sterility of cuspidors is not of vital importance, provided a high degree of cleanliness is maintained. It is well, however, to have these articles of equipment installed so that complete sterilization can be carried out in case an unusual infection, such as diphtheria, is encountered.

The possibility of the operator transferring infection to the cable of the dental engine above the hand piece, and then later from the cable to another patient, has been mentioned. If the cables have the power-transmitting mechanism inside a covering, this can be avoided by a simple sterile or clean cotton sleeve, with a draw string in each end,

which can be slipped over the cable and tied after the hand piece is in place, so that the whole cable is covered down to the sterile hand piece. This allows the operator to handle the cable at will during his operation, and, when a second patient is treated, a second clean sleeve is put on in place of the first one. It is also probable that a flexible metal covering, of tubing such as is used for conducting gas to lamps, might be constructed so that this could be removed and sterilized by heat. This is not applicable to engines which transmit the power from engine head to hand piece by open cord belt.

The use of foot levers for turning on the flow of hot and cold water in the washbowl is a great convenience to a busy operator who desires to keep his hands sterile. The use of a clean washable covering for the operating chair is a step in the direction of asepsis and cleanliness. The headrest should have a clean linen cover, renewed for each patient.

There should be toilet facilities for patients and, in addition to the usual lavatory equipment, a dental bowl, like that seen on Pullman cars, so that a patient may brush his teeth without doing so over the washbowl.

To place the patient's mouth in as clean condition as possible, each patient should brush his teeth, preferably immediately prior to coming to the chair. This should be followed by a thorough rinsing of the mouth with some good mouth wash. This procedure is a mechanical cleansing, aimed primarily at the removal of spores from the field of operation, though many other organisms are removed at the same time.

In order to do this the dentist should have a supply of tooth-brushes on hand and, if necessary supply a new brush to each patient. This may be the patient's first encounter with the oral hygiene educational movement, but I believe it will be productive of good. I believe that the dentist should add the cost of the brush to the patient's bill, unless brushes can be obtained at so low a figure as to make their free distribution practicable. A supply of mouth wash should be on hand in a convenient place for use by patients.

Paper drinking cups and paper, or small individual, towels for patients should be furnished. The common drinking cup and towel are abolished on all interstate carriers, and in hotels and public places in many States. It is, therefore, fitting that the members of the medical and dental profession should apply the spirit of these laws to their own establishments, even though the letter of the law does not require it.

Clean linen direct from the laundry is not sterile, but offers only the remotest chance for transmission of infection through it. Sterile linen is desirable and for a busy dentist, apparatus for its sterilization will be a great addition to office equipment. Steam pressure sterilizers are preferable for this, though other types may be used.

SUMMARY.

As a result of the experiments and investigations detailed above the writer reaches the following conclusions and recommends the following methods for sterilization of dental instruments:

CONCLUSIONS.

1. Moist heat is our best disinfecting agent for the sterilization of all metal instruments.

2. For the destruction of non-spore-bearing bacteria, moist heat at 80° is nearly as efficient as boiling, and for practical purposes can be used in place of boiling.

3. Instruments constructed of metal, whose complicated mechanism has heretofore caused them to be considered as non-sterilizable, can be sterilized by moist heat, provided the water is removed from them by immersing in alcohol subsequent to sterilization.

4. Instruments, whose construction does not permit of boiling, can be sterilized by chemical disinfectants.

5. There is need for more practical instruction in dental schools and clinics in the methods of sterilization, and the subsequent testing of the same by bacteriological methods.

6. Dentistry, which is a highly specialized branch of surgery, should use the two factors, asepsis and anæsthesia, which have made possible the wonders of modern surgery, with skill and precision equal to that of surgeons.

RECOMMENDATIONS.

1. That all instruments and appliances be rendered mechanically clean by washing in water with a brush or sponge.

2. That the following instruments and appliances be boiled or submitted to 80° in a slightly alkaline solution (0.25 per cent sodium hydroxide):

Artificial teeth used in matching and measuring.

Broaches and their holders.

Burnishers.

Burrs.

Chip blowers.

Chisels.

Drills.

Excavators.

Explorers.

Files.

Forceps, extracting.

Forceps, foil.

Hand pieces for engine.

Impression trays.

Knives and lancets.

Mallets, hand and automatic.

Mixing slabs.

Mouth gags.

Mouthpiece of saliva ejector.

Pliers.

Pluggers.

Pyorrhoea instruments.

Polishing points and brushes (if not discarded after using once).

Reamers.

Root elevators.

Rubber dam clamps and forceps for same.

Rubber dam weights and metal parts of holder.

Saws.

Scalers.

Scissors.

Scratch wheel on head of engine.

Spatulas, metal.

Syringes, hypodermic.

Syringes, water.

Tongue-holding forceps.

Mirrors (if 80° bath be used, but not to be boiled).

3. That instruments in the above list whose mechanical construction makes it difficult to remove the excess of water are to be placed in 95 per cent. alcohol for 10 minutes to remove water, then removed and allowed to dry.

4. That only instruments with metal handles be used by dentists desiring to follow this method.

5. That the following instruments be sterilized by immersion in 5 per cent. solution of phenol for at least 60 minutes:

Mounted stones.

Tortoise-shell instruments.

Mirrors (when 80° bath is not used).

Other instruments not of metallic nature and which can not be replaced by metallic instruments.

6. That instruments, after using, be placed in a fluid medium, preferably clean water, to avoid drying of infectious material and to facilitate their mechanical cleansing.

7. That no instrument or appliance, used on a patient directly or indirectly, be used on any other patient until recommendations 1 and 2, or 1 and 5, as the case may be, have been complied with.

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Education: The Social Instrument.

THE foundations of health education must be laid in the schools. This is of particular importance in the light of our modern conception of health work. In our more advanced communities we scarcely need speak longer of public health work. It is possible now to drop the word "public" and to talk of health. This means that personal health, personal hygiene, is to be the keynote of modern sanitation. The schools are, beyond comparison, the most valuable instruments for the instruction of society's members in the matters of hygiene.—Donald B. Armstrong, M.D., *American Journal of Public Health*, December, 1915.

Some New Features Shown at the Dental Manufacturers' Exhibit, Chicago, April, 1916.

BY A CANADIAN DENTIST.

THE manufacturers of dental appliances and supplies deserve credit for the progressive spirit shown in developing new products designed to make the work of the dental surgeon more efficient. The progress of dentistry, as it has occurred in the past, has been markedly influenced and assisted by the dental manufacturer. Whether it be filling material or instrument or article of furniture, a high standard of quality has been set, and this has materially assisted the dental surgeon in the work of his profession. To eliminate the work of the dental manufacturer from modern dentistry would be to turn back the wheels of progress to an appreciable extent, and, while members of the profession frequently feel that the manufacturer has many times shown a lack of consideration for the dentist, there is little doubt that the dentist has just as frequently shown a lack of consideration for, and appreciation of, the work of the dental manufacturer.

INTERCHANGEABLE TEETH.

For instance, few dentists realize the amount of labor entailed in the production of an interchangeable tooth. It is physically impossible to build up a porcelain tooth, composed of different mixes of porcelain, to give the desired color and consistency, and which, after fusing, will be exactly like the original mould. In other words, simple fusing and interchangeability are impossible. This is due to a number of reasons. To commence with, there is a shrinkage in baking of from 26 per cent. to 40 per cent. Distortion is also another feature to be considered. This latter may occur simply by the opening of the furnace door and the consequent flow of a current of cold air, or the teeth being fused on an asbestos tray covered with granular silex may be distorted by any slight unevenness in the bed of silex, causing a sagging of the biscuit. Then, again, the simple process of closing the mould frequently exerts an uneven pressure with consequent distortion.

These distortions are impossible to prevent, and they must, therefore, be removed by machine grinding after the porcelain is baked. This grinding is accomplished by a diamond powder mounted on steel and copper alloy instruments. First the back of the facing is ground flat to a microscopically predetermined distance from the centre of the hole and made parallel with the hole. The back of the facing having been made flat and parallel, the next step is to centre the slot, grinding it out to its proper width and extending it to its proper depth in relation to the incisal edge of the tooth. This centres

the slot perfectly and brings the operation to the stage of standardizing the hole. This is accomplished by diamond-charged drills mounted on a multiple spindle machine. Thus in making an ordinary Steele facing the tooth passes through four processes and seven operations.

1st.—Flat grinding.

2nd.—Standardizing of slot.

3rd.—Standardizing of hole, consisting of four operations.

4th.—Sizing the tooth. This process tests out all dimensions of the tooth in relation to each other and discovers and corrects automatically any inaccuracies or imperfections.

The backing has, of course, to be made just as perfect as the tooth, for unless the tooth is properly supported by the backing, maximum strength is not attained. The backing is put through seventeen distinct operations after the metal is rolled and cut to size. Gauge 26 is used to prevent warpage or distortion of the backing.

The profession will be glad to learn that the Columbus Dental Company have secured the co-operation of Dr. Leon Williams, who has already made a series of moulds for Steele posteriors on his "trubyte" system, and it is expected that these will be on the market during the present year.

AN ELECTRIC VULCANIZER.

The Buffalo Dental Manufacturing Company exhibited a Lewis vulcanizer with electrical heater and special control for both time and heat. This machine is made for any voltage and for either direct or alternating current. It possesses all the advantages of electricity over gas, and is cleaner and more steady in operation. Upon the desired heat being reached the current is cut off and turned on again automatically as frequently as is necessary to maintain the predetermined degree.

One of the apparent advantages of the electric vulcanizer is that it cannot be heated up too rapidly, thus avoiding porosity in plate work. Depending upon the temperature of the water used, the vulcanizer reaches 320 degrees in from twenty-five to thirty-five minutes.

BUBBLING CUP ATTACHMENT FOR CUSPIDOR.

Many new designs for fountain cuspidors were shown, and one of the newer features which have been well developed by the A. C. Clark Co. is that of the bubbling cup attachment. People are being educated to this sanitary method of drinking water, and it is preferred by most patients to the use of the paper cup. Unless the ordinary drinking glass is cleaned, sterilized and polished for each individual patient, the bubbling cup is certainly much to be preferred in dental practice.

MAINTAINING DENTAL INSTRUMENTS IN PROPER CONDITION.

A new service has been added to the organization of the Cleve-

land Dental Mfg. Co. to be known as the "Efficiency Department." This department issues an "Efficiency Service" contract, which permits the dentist to send burs of all kinds, root facers, reamers and other engine instruments of the Clev-Dent manufacture to the Cleveland factory to be resharpened. The instruments are, of course, duty free, and are shipped in mailing cases supplied by the company. The charge of this service is \$7.20 per year, or in other words, 60c per month, regardless of the number of instruments in use or frequency with which they are sent. Any bur with broken blade or that cannot be sharpened is returned to the dentist. Under this system, it is argued, more painless dentistry will be practised than would otherwise be possible, and the suggestion is made that those taking advantage of this service should not use a bur for more than one patient without sending it to the factory for resharpening.

SPECIAL ENGINE BUR STEEL.

The Ransom & Randolph Company exhibited a complete range of engine burs made of special alloyed steel. It is claimed that the bur may thus be tempered to greater hardness than is possible with ordinary steel, and yet avoid undue brittleness.

NEW DENTAL FURNITURE.

A special prophylactic cabinet, shown by the American Cabinet Co., attracted a great deal of interest. The cabinet is smaller than an ordinary dental cabinet, and is light and portable. The upper section consists of six trays, twenty-six inches wide, with sufficient room for two complete sets of pyorrhea instruments. The lower part is arranged for strips, discs and other instruments used in prophylactic work. The object is to have all these instruments together and separate from the regular cabinet.

This company also exhibited a very ornate waste holder, which is designed to supplant the "Just-Rite" pail. It stands upon the floor in the form of a mahogany pedestal, and contains a sanitary paper bag, which may be lifted out and thrown aside with the contents.

PYRAMID AND CONE IMPRESSION POINTS.

Kerr Compound was shown in boxes of both pyramid and cone-shaped pieces for taking the impression of a cavity in inlay work by the indirect method. There was also shown a special "set-up" wax for attaching and holding the teeth during a try-in. Special wax for this purpose was also exhibited by the Caulk Company.

NEW ROOT CLAMPS.

Bicuspid and molar root clamps upon lines of new construction enabling them to catch and hold on almost any shaped tooth, was shown by the Ivory Company. Also special wisdom tooth clamp for use in cases where the tooth is almost covered with gum tissue.

All-metal hand port-polishers, which enable thorough sterilization, also a lock band plier for holding the end of polishing strips, were of interest.

SYNTHETIC CABINET.

The new synthetic cabinet of the Caulk Company was much in evidence. This cabinet contains a heavy slab, with agate spatula, four ivory instruments with celluloid strips, eight powders and liquids with varnish and cavity lining.

The metal cocoa butter holder is most convenient and contains a stick of cocoa butter modified with wax. This appliance enables the use of cocoa butter without the operator taking it in his hand, which is particularly advantageous in hot weather.

COLD GOLD INLAY.

The Williams Gold Refining Co. had, at their exhibit, Dr. J. G. Hollingsworth (the originator of the Hollingsworth system) demonstrating his method of constructing gold inlays.

Under this system the cavity is prepared the same as for an inlay. A special wax impression is then taken and an investment made with special cement, which is reinforced by means of a metal cup. This model is then placed in machine, which enables the gold to be condensed in the mould at high pressure. The pressure may be varied at will.

After the investment hardens the wax impression is lifted out and serves as a guide for finishing the occlusal surface of the filling.

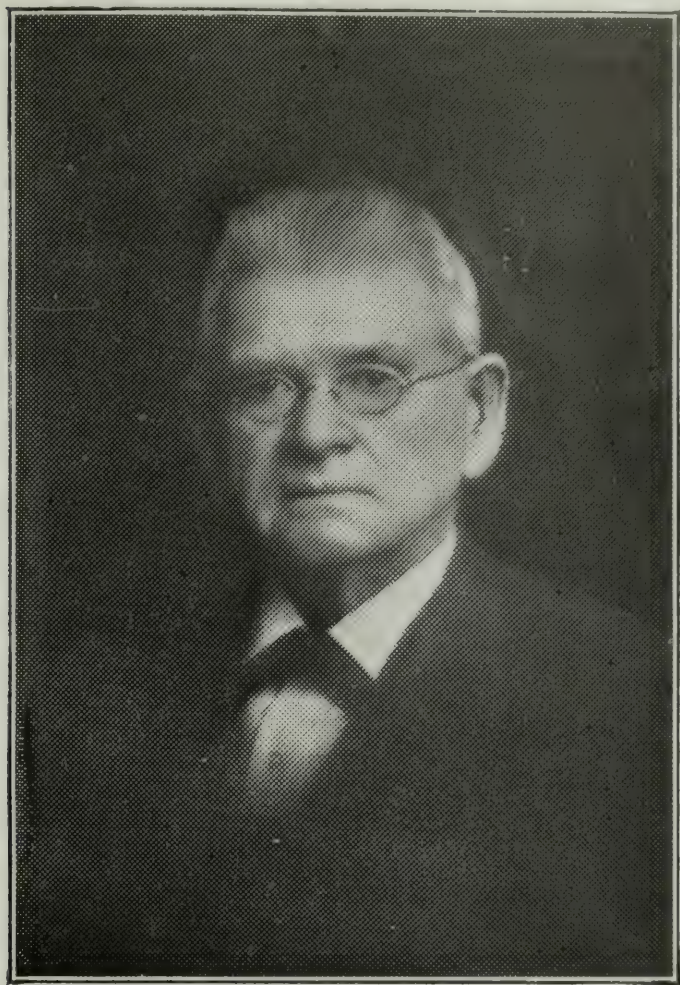
THE NEW CABINET SWITCHBOARDS.

Throughout the entire exhibit there seemed to be a tendency to depart from the fixed wall switchboard and to move in the direction of a separate unit. The Ritter Company showed some very attractive switchboards, mounted in a cabinet, and with a wall mount that concealed the cords.

The Pelton & Crane Company have carried the idea a step further and have produced what they call the "Electricabinet," which is much smaller than the usual switchboard cabinet, and constructed in a way to make it portable and automatic. The rheostat is set at an average point, and by picking up the instrument the current is connected, and by merely dropping the instrument back to its place the current is cut off. The portable and automatic features of the "Electricabinet" are very attractive.

ONE DISAPPOINTING FEATURE.

There was one disappointing feature. Many well-known manufacturers did not exhibit. Exhibits of this character should be made as comprehensive as possible so that the educational features may be enhanced and members of the profession may have opportunity of studying all branches of dental manufacturers' art.



DR. JACOB WESLEY GREENE

Born January 18, 1839.

Died February 27, 1916.

An Appreciation of the Late Dr. Greene.

DR. WILLIAM A. GIFFEN, DETROIT.

IN the passing of Dr. Jacob Wesley Greene, the dental profession has lost one of its most esteemed and best known members, who for more than fifty years gave his best efforts to the public. Dr. Greene originally located in dental practice in New Albany, Indiana, where he married Miss Ann Eliza Pitt, October 25, 1863. In 1866 he removed to Chillicothe, Missouri, where he was one of the leading dentists and citizens for many years.

About eighteen years ago he, with his brother, Dr. P. T. Greene, improvised the Greene System of Special Test-Method Impression

Taking and Plate Work, which he taught throughout the United States and Canada.

In addition to instructing a great many dentists in his private course, he spent considerable time lecturing to societies, until to-day his methods are recognized as being most practical.

In 1910 he published and copyrighted Greene Brothers' Clinical Course in Dental Prothesis on "New and Advance Test Methods," which has had and is still having a wide circulation in this country and abroad.

He was a man of great strength of character, a profound student; a man who was always ahead of his time in thought, but lived to see many of his ideas adopted.

He was devoted to his family and never was known to spend an evening away from home, excepting on his lecturing tours. He left four children: Dr. Dora Greene-Wilson, Kansas City, Mo.; Mrs. C. R. Hughes, Kansas City, Mo.; and a daughter and son in the Far West.

Dr. Greene, just previous to his death, was about to publish, in book form, a number of poems of which he was the author. "The Final Calculation" was his favorite, and we herewith publish it in part:

THE FINAL CALCULATION.

In viewing our relation to men and things about us,
We wonder how the world would get along without us.
But men have ever wondered the same in times before us,
And so will generations, when we are gone, ignore us.
As men have come and acted in past unnumbered ages,
Just so will they continue to write its coming pages.
'Twere not the times forgotten, nor the future's hidden woeing
That now should most concern us, but what it is we're doing.
Are we in turn (now listen) from human-kind receiving
More blessings than the sorrows and woes we are relieving?
We're either thorough bankrupts—no disputing our relation,
Or human benefactors in the final calculation.

Oral Hygiene Report.

HALIFAX SCHOOL BOARD COMMITTEE.

THE following report has been submitted to the school authorities of Halifax by a committee of the Board, appointed for the purpose of presenting data upon the question:

To the Chairman and Members of the Halifax School Board:

Your committee on dental and eye and ear work beg to submit the following:

1st.—That a dentist of good standing be employed by the Board for a year, to give one afternoon a week during the school term to the exclusive work of the Board. This work to be carried on in his own office, and that the dentist employed shall buy his own materials. For remuneration he shall receive \$300.00 per annum.

2nd.—It is recommended that the Board appoint the Educational Committee of the Nova Scotia Dental Society as an advisory board on dental matters, in pursuance of the method employed in many cities on this continent. The result of such an action being that the Board always has at hand expert advice on all dental matters gratis.

3rd.—It is considered advisable by the committee, if at all possible, to get a room in the new (Acadian) school, and equip it for a dental infirmary. The location will appeal to the Board for the reasons below stated at least:

- (a) This location is in the part of the city most in need of dental service.
- (b) Will be near the office, consequently the nurse and medical doctor will be available for assistance any time they are needed, as in anesthetic cases or minor operations.
- (c) Having such a room in one of our school buildings, we would be following what many other cities from experience have proved to be the best method of housing the school clinics.
- (d) Be under the eye of the Board.

4th.—The way to finance this recommendation may be outlined as follows: Of the \$1,000 appropriation that we have at our disposal that \$600 this year be given over to the dental work. \$300, as stated above, to go to the appointed dentist for his services, and the other \$300 to put in as much first-class equipment as it will buy. Then at the beginning of the next financial year finish equipping the room, and install the operator in his new quarters. This equipment would cost between \$500 and \$600.

5th.—Both the Educational Committee of the Nova Scotia Dental Society and your own committee cannot impress upon the Board too strongly the advisability when furnishing this room of using the very best and latest equipment available.

6th.—You instructed your committee to further report on the eye, ear and throat work in the schools. In reference to this, the committee feel that a separate and detailed report on it would cover the matter more to the general satisfaction of all. Such report we shall present very shortly.

Respectfully submitted.

(Signed) R. H. WOODBURY,

Halifax, N.S., March 30, 1916.

Chairman.

The Ontario Temperance Act As It Affects Dentists.

THE executive of the Toronto Dental Society is to be congratulated upon its action in bringing to the attention of the Ontario Government the requirements of the dental profession under the Ontario Temperance Act.

The suggestions contained in the following letter evidently commended themselves to the Government, the regulations being finally adopted in the form suggested:

COPY OF LETTER FROM EXECUTIVE TORONTO DENTAL SOCIETY
TO THE HON. THE PROVINCIAL SECRETARY.

Toronto, April 5th, 1916.

Hon. W. J. Hanna,
Parliament Bldgs.

Dear Sir,—Whereas an Act entitled “The Ontario Temperance Act” is being considered by the Legislature of Ontario, and whereas Section 38 of said Act provides for the sale by a licensee and a duly qualified member of the Royal College of Dental Surgeons of Ontario of one pint of liquor for use in his profession, we, the executive of the Toronto Dental Society, hereby request that a slight change be made in the Act to allow a duly qualified member of the Royal College of Dental Surgeons of Ontario to purchase, at one time personally, a quantity not exceeding six ounces.

And whereas Sec. 60, Sub-sec. 2, provides that a dentist who is a duly qualified member of the Royal College of Dental Surgeons of Ontario may keep in his office a quantity not exceeding one pint at any one time, we would also hereby request that this amount be reduced to a quantity not exceeding six ounces.

The above requests are made with the knowledge of the limited use of liquor as a stimulant or restorative, and we deem a quantity not exceeding six ounces quite sufficient for all dental purposes.

Furthermore, we consider that a quantity so much greater than is necessary would tend to encourage the abuse of the privilege and use of liquor which is not intended in the Act.

Trusting that these requests will meet with your approval, and that you will lend your assistance to our endeavors to safeguard the best interests of the public in general and of the dental profession in particular, we are,

Yours very truly,

R. D. THORNTON,
Secretary, 312 Roncesvalles Ave.

E. F. ARNOLD,
President, 2 Bloor St. E.

Important Legal Decision in Manitoba Courts.

THE following judgment has been handed down by His Honor Judge Paterson of the County Court of Winnipeg, in which the taking of an impression of the mouth, or the fitting of appliances in the mouth, are held to be included in "the practise of dentistry." A similar decision was rendered by the Toronto Police Court Magistrate some years ago. These cases would seem to put the question beyond dispute. The judgment is of such importance that we publish it in full:

JUDGMENT—BOWLES VS. THE KING.

In this case action was taken under Section 31 of The Dental Association Act, being Chap. 53 of the R.S.M. 1913. The information was laid against the accused on a charge of practising dentistry for gain, not being a registered dentist. Action was taken in the Winnipeg Police Court and the case was heard before Sir Hugh John Macdonald, magistrate, and dismissed. The informant, who is an officer of the Dental Association, appeals against the decision. All importance attaches to what constitutes practising dentistry, and whether making a plate for the mouth with one or more teeth attached comes within that category. In *Henram & Co., Limited, vs. Duckworth*, 20 T.L.R., 436, it was held that making a plate was not practising dentistry, and were it not for such like authority I would be strongly inclined to think it is part of the work of the practising dentist. It does seem to me that any work properly performed by a person claiming to be a dentist and performed in or for the mouth of a patient pertaining to the teeth, or furnishing what is commonly called artificial or false teeth, would constitute dentistry, and if done successfully would constitute the practise of dentistry. *Henram vs. Duckworth* is authority also for holding that taking an impression and fitting in a plate is practising dentistry. Objection was taken by counsel for the accused as to the regularity of the proceedings in bringing on this appeal which I have, after some consideration, overruled, as they were more or less technical.

The facts as I find them from the evidence are that accused was employed in the dental parlors of Dr. Glasgow in the city of Winnipeg; that on the 16th of June one C. A. Benjamin called at the parlors and was asked to return, which he did on the 17th, when the accused examined his mouth, took an impression of his gums, and later on in the day fitted a plate in his mouth. On the 21st of June he did some work for one Fetterly by grinding one of his teeth with some kind of instrument. The accused, and Dr. Glasgow for him, both endeavored to minimize this evidence, but I do not think the witness Fetterly was not stating a fact as to the work on the teeth even if he could not just locate the room in which it was done or the

exact kind of instrument the accused used. I believe accused did do some work, properly the work of a dentist, on Fetterly on that date.

I should think the evidence would not require to be very severely sifted when, as in a case such as this, the accused was employed in a somewhat extensive dentistry office and where he was known as Dr. Austin, where he did a considerable amount of work. I think there might be a very strong presumption that the accused was practising the profession of dentistry.

Was he practising for hire, gain or hope of reward? From the evidence of himself and Dr. Glasgow it might readily be concluded he was not working merely to mark time until the fall when things would be better. He was receiving \$42.00 per week until the time of the laying of the information before the magistrate; these weekly payments were suddenly stopped if the witnesses are to be believed, but there was no stopping of work on the part of the accused. He went on as usual doing, as he said, work for others, and using the material and tools of Dr. Glasgow. If he got nothing else than the material, quite a lot of which he said he used, or if he got nothing but that and the privilege of doing his own work in Dr. Glasgow's premises, he was not working without gain, and the statement that he was to work until fall, when times would be better, would be some hope of reward. In short, I do not credit the statement that the accused was not working for gain to Dr. Glasgow, for nothing for himself, but on the contrary I believe he was working for gain. I look upon the transaction when he directed Fetterly to pay the cashier for work done by himself as a mere subterfuge. The money paid was for services performed by accused and landed in Dr. Glasgow's hands to pay for a room in which accused occupied working quarters, for tools which accused was performing dental operations with, and for material that accused used on his own behalf.

I find that accused did take an impression of the gums and later fitted a plate in the mouth of Benjamin, and that on the 21st he did some work for Fetterly, and that the accused was on the 16th, 17th and 21st days of June practising dentistry for gain and without being registered under the Dental Association Act. I allow the appeal and fix the fine at \$50.

(Signed) GEO. PATERSON,

January 6, 1916.

Judge, Winnipeg County Court.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

SUCCINIMID OF MERCURY.

SO numerous and so ineffective have been the remedies offered for the treatment of pyorrhea alveolaris, that the addition of one or more to the list creates, possibly, little interest. If, however, it can be shown by clinical evidence that a particular method of treatment will bring about a very high percentage of cures, then the attention of the profession is bound to be focussed upon the new arrival.

The use of succinimid of mercury as a means of combatting pyorrhea is being advocated by some of the leaders of American dentistry. In the opinion of Dr. Kusel (Cosmos), the only proper method of administration is the intra muscular injection. Subcutaneous injection produces most distressing results: irritation of the part occurs, leaving a painful area which may remain unhealed for some considerable time.

The technique of mercurial injection is described by Dr. C. S. Copelan (Cosmos), and is based on his observation of the method followed by the originator of the treatment—Dr. Wright, of Portsmouth Naval Yard, U.S.A.: "The syringe used is made by Burroughs, Wellcome & Co., all glass and holding forty minims. The needles used are No. 26 intra muscular for the above syringe. The solutions are so made that gr. 1-5 of mercuric succinimid is dissolved in four minims of hot, sterile distilled water. The site of injection is the buttock, using alternate sides for succeeding injections. The skin is sterilized with tincture of iodine. The method of inserting the needle is as follows: The needle butt is held between the thumb and finger, with the index finger over the butt. The shaft of the needle to be perpendicular to the skin surface, the point about three inches from it. With a quick, forceful, downward thrust, the needle is driven deeply into the substance of the gluteal muscle, from point to butt. Then into the syringe as many minims of the sterile mercuric solution as represent the desired dose are drawn; if it is to be gr. 5.5,

minims XX will be required. Then the syringe tip is inserted into the socket of the needle and the injection is made slowly. The needle is withdrawn and tincture of iodine is applied to the point of injection. The injections are to be repeated every seventh day."

The amount of favorable evidence submitted by numerous practitioners testifies to the efficacy of this remedy. No one can question the sufficiency of the dentist's skill in administering this or any other drug, yet in view of the area to be operated upon it would almost seem advisable that it be left to the physician. The administration of any remedy by methods simulating that described above might, in the opinion of the public, be outside the proper sphere of dentistry. If any unfortunate results occurred it might be a difficult matter for the dentist to assuage public sentiment.

NICKEL-COPPER AMALGAM.

The value of copper-amalgam in dental operations has long been recognized. The ease with which it may be manipulated, its hardness, its preservative qualities, place it well up in the list of good fillings materials. Its disadvantages, both of color and solubility (cupping), limit its use however.

Dr. Sims Lever (*Commonwealth Dental Review*) describes a nickel-copper amalgam which, in his opinion, "has all the virtues of copper-amalgam without any of its disadvantages." It is claimed for this nickel-copper-amalgam that it stands the stress of mastication perfectly, keeps a good color, does not stain the tooth substance, does not expand or contract, and gives no indication of cupping—a characteristic of copper-amalgam due to the solubility of its parts.

Dr. Lever finds that this amalgam answers most satisfactorily in those almost inaccessible positions where it is absolutely impossible to obtain or maintain a dry cavity. It is eminently suitable for children's teeth, both temporary and permanent.

GOLD IN DENTAL AMALGAMS.

Many of our leading authorities on amalgams question the advisability of incorporating gold in dental amalgam alloys. Others claim that a small percentage of gold imparts a pleasing whiteness to the alloy. To this last group belongs Dr. W. Bruce Hepburn. His alloy consists of gold, silver, copper and tin in the following proportions:

Gold	4.4 per cent.
Silver	52.0 per cent.
Tin	40.6 per cent.
Copper	3.0 per cent.

Dr. Hepburn describes his method of preparation as follows: "I melt the gold in a new crucible, which has been annealed and glazed with borax. The silver and only half the copper is stirred in, using a carbon rod for the purpose, then the balance of copper, meanwhile the heat being gradually lessened, only sufficient being applied to

keep the metals liquid and not blazing hot. On the last of the copper being dissolved, carbon chips are dropped in, the heat is cut off, and the tin wrapped in tissue paper dropped in in small quantities and well stirred. The addition of tin causes the lowering of the melting point of the alloy, hence the cutting off of the heat. The alloy is poured into a well-oiled ingot and immediately immersed in cold water."

The subsequent treatment refers to the filing of the alloy. The 6-inch bastard file is used for this purpose. Any particles of steel are removed from the filings by means of a magnet. In order to age the alloy it is bottled up and placed in boiling water for fifteen minutes.

Dr. Hepburn concludes his excellent paper by a warning against the use of zinc in dental amalgam alloys. He finds that zinc "seems to exhibit the peculiar effect of acting, even in conjunction with silver, tin and copper as a separate metal, and wasting and washing out."

PARAFORM.

This preparation is described by Dr. C. Evory Brown (*British Dental Journal*) as conforming very nearly to the ideal obtundent. It is a white powder, powerfully antiseptic, and with a pungent odor. Paraform is simply solidified formaldehyde gas. Being very irritant, it must not be placed near the dental pulp.

In applying paraform to a cavity it is best to mix the required portion with temporary cement, incorporating the paraform with the cement. The mixture is allowed to remain in the cavity for about three days. Owing to its extremely irritating qualities, paraform ought to be kept away from those cavities where caries has penetrated well into the tooth substance, and its use ought to be confined to superficial cavities—those being at all times the most sensitive.

"The effect of paraform upon dentine tissue varies in proportion to the hardness of the tissue to which it is applied. In small cavities, which have only just penetrated the enamel, it acts slowly and with difficulty. On the hard polished surfaces of erosion cavities it also finds great difficulty in penetrating, but in cases where the dentine is soft enough to be removed with an excavator, a ten per cent. dressing will quickly penetrate an appreciable distance, and render the cavity quite insensible up to the limit of its penetration."

In the cavities approaching the pulp, paramono-chlorophenol is recommended as a useful drug, being a powerful anodyne and antiseptic. "A powder composed of zinc oxide, with ten per cent. of thymol mixed to a stiff paste with a liquid consisting of equal parts of paramono-chlorophenol and eugenol, is extremely soothing. This liquid, if used to moisten arsenical fibre when devitalizing nerves, greatly helps to control the pain."

ROOT CANAL TREATMENT AND FILLING.

During the past few months the especial attention of the dental profession has been directed to the importance of correct methods in

the treating and filling of root canals. At a recent convention, held in Chicago, a large percentage of the clinics given dealt with this phase of dental operations.

In view of the amount of attention which is being given to this subject, we read with great interest and profit a paper by Dr. Geo. C. Poundstone, Chicago, published in April issue of *Dental Review*, "Root Canal Treatment and Filling." In this paper he outlines in detail his method of operation.

In the opinion of the author, it is impossible to prepare a vital tooth for a crown without endangering the life of the pulp and causing the patient pain. He therefore urges the necessity for removing the pulps of teeth to be so treated, and providing an efficient filling to replace the lost tissue.

It is suggested that, when pulps having dead coronal and vital apical portions are to be removed, a treatment of beechwood creosote be sealed in the cavity for three or four days, after which time the remaining pulp may be removed with little pain to the patient. Dr. Poundstone does not favor the practice of sealing in arsenic against the vital apical portions of the pulp on account of the close proximity to the apical foramina. There is always a danger of the drug passing through the openings and setting up inflammation in the process.

When treating gangrenous pulps, extreme care is necessary in order to avoid the forcing of any of the contents through the apical foramen. In the author's opinion, formo cresol is an excellent preparation for use in such cases, yet it must be cautiously handled in order to prevent the condition of soreness so evident in teeth that have been subjected to the influence of this drug. "Formo cresol must have putrescent material to work upon, that the formaldehyde gas may be neutralized. Therefore, if there be no putrescent material present to neutralize the expanding formaldehyde gas, it will pass through the apical foramen and irritate the peri-apical tissues, causing soreness and tenderness."

Enlarging the Canals.—When enlarging root canals, Dr. Poundstone places great dependence upon the use of barbed broaches. The fine barbed broach is inserted in the canal to be enlarged, and withdrawn several times. "By withdrawing the broach, inclining it in turn towards all sides of the canal several times, the smallest canal will be enlarged sufficiently for treatment and the reception of a good filling." A word of caution is given against the practice of rotating barbed broaches in small root canals. The preferable course suggested is the insertion and withdrawal of the broach with a lateral pressure in order to file away the sides of the canal. The use of acids as a means of enlarging canals is not deemed advisable, owing to the uncertainty as to the extent and direction of its action.

Sterilization of Canals.—After the pulp has been removed and the root canals have been enlarged, an antiseptic dressing is sealed in for a few days.

Cleansing the Hands.—On the bracket-table is placed a small jar of antiseptic solution (cyanide of mercury). In order to cleanse the fingers after touching anything that might be unclean, the operator dips a piece of cotton in the solution and squeezes it between the fingers. A clean napkin is used to wipe away the liquid from the hands. In this way there is little danger of contaminating the cotton, etc., used in dressing root canals.

Gutta-Percha Cones.—All cones are sterilized by placing them in 95 per cent. alcohol for ten minutes. After drying in aseptic gauze, they are placed away in large sterile gelatine capsules.

Cotton.—The cotton is purchased in cartons and is accepted as being aseptic. It is put away in tightly covered containers and so protected from the air.

Rubber Dam.—The placing of the rubber dam about the tooth to be treated is deemed absolutely necessary if asepsis is to be established. Before adjusting the dam both tooth and gums are subjected to suitable treatment to remove all foreign substances.

Drying Canals.—When the canals are opened up, all traces of cotton, etc., are carefully removed and the canals are bathed with 60 per cent. alcohol, applied on cotton with a smooth broach. This is absorbed by dry cotton and the application of warm air. If hot air be applied too freely there is a likelihood of causing injury to the tooth structure by over-dehydration. Only the surface moisture should be removed, hence 60 per cent. alcohol is used.

Lubricating Canals.—The canals receive an application of eucalyptol. This lubricates the canals preparatory to the insertion of the filling material.

Filling Canals.—A section of gutta-percha cone, not more than 3 millimeters long and of a size corresponding to that of the canal, is attached to a heated plugger and allowed to cool. It is then dipped in eucalyptol and carried into the canal and forced as far as it will go. The plugger is then removed, warmed and again passed into the canal and more condensation of the gutta-percha secured. Other pieces of cones are attached to the plugger and carried into the canal and condensed until the canal is completely filled. Any excess in the pulp chamber is then removed with a heated ball burnisher, which at the same time seals over the mouth of the canal.

Eastern Ontario Dental Convention.

THE Eastern Ontario Dental Association will hold its annual meeting at Stanley Island, June 21st, 22nd and 23rd, 1916.
L. E. STANLEY, Secretary.



Complimentary copies of
ORAL HEALTH will be sent
during the progress of the
war to all Dental Graduates
on active service whose
army address is known.

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MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

SECURING HIGH POLISH IN VULCANITE PLATES.—To put a high polish on plates, the chalk is mixed with ammonia water instead of pure water and washed off with tepid water.—*Pacific Dental Gazette (Dental Cosmos)*.

EXTRACTING UPPER TEETH AND LOWER TEETH AT THE SAME SITTING.—Where it is necessary to extract teeth or roots from the superior maxilla and the inferior maxilla it is always best to operate in the inferior maxillary region first. By so doing the field of operation will not become obscured, whereas if you operated in the superior maxilla first the inferior maxilla and the floor of the mouth would be entirely filled with blood and render the operation complicated and difficult.—*Walter C. McCauley, Boston, Mass. (Dental Review)*.

TO FACILITATE CEMENTING A GOLD OR PORCELAIN INLAY.—Mounting the inlay, in its proper position, to enter the cavity in the right direction, on a tapered orange-wood stick will greatly expedite matters when it means much to both operation and patient. It avoids all possibility of confusion that so often arises when using tweezers or fingers to place inlay in cavity while both of the latter have been smeared with cement, thus causing more deception as to position.—*W. D. N. Moore, Chicago (Dental Review)*.

REPAIRING PLASTER CASTS.—Celluloid is dissolved in equal parts of camphor and ether, enough to make a creamy mixture. The parts of the cast are perfectly dried, painted with this solution, firmly united, and allowed to dry. This celluloid mixture is insoluble in water, and does not suffer by vulcanization.—*La Odontologia Peruana (Dental Cosmos)*.

A DRESSING FOR IMPRESSIONS BEFORE POURING WITH PLASTER OF PARIS.—Dissolve base plate rubber in chloroform; apply by coating impression. Warm before separating by tapping it, only when a full upper.—(*Dental Summary*).

WATERPROOFING PLASTER MODELS.—To make plaster models which can be washed, the following procedure is used: First, the model is hardened by applying a solution of borax and alum. Then some insoluble precipitate is used which will fill up the pores and produce a very hard surface. The salts of barium, calcium, or strontium are suitable, and will not stain the model.—*Revistas Dental de Perie (Dental Cosmos)*.

TO PREVENT ENGINE CORD FROM SLIPPING.—A little beeswax and resin applied to the engine cord will prevent it from slipping.—*Pacific Dental Gazette (Dental Cosmos)*.

SECURING BRIGHTNESS IN ALUMINUM RUBBER PLATES.—The hydrogen sulfid liberated in vulcanizing has a tendency to darken the aluminum in aluminum rubber plates. To avoid this, the aluminum base plate is covered with shellac or sandarac.—*Zahnaerztliche Rundschau (Dental Cosmos)*.

TO KEEP SYNTHETIC SLAB POLISHED AND FREE FROM GREASE.—Take wet powdered pumice on tips of fingers. Polish slab all over; rinse in running water and slab is like new again; this will not scratch.—*E. P. Hanrahan, D.D.S., Chicago, Ill. (Dental Digest)*.

EMERGENCY REPAIR OF RUBBER BULB OF CHIP BLOWER.—The break in the rubber bulb of a chip blower may be covered with a piece of adhesive tape. This makes it as useful as ever.—*J. A. Tibboth, D.D.S., Wilkensburg, Pa. (Dental Digest)*.

CLEANING THE CERVICES OF TEETH BEFORE APPLYING THE RUBBER DAM.—The rubber dam should never be applied to a tooth before its cervix has been cleaned and disinfected. If this precaution is omitted, infectious material is forced by the rubber and the ligatures under the gum margin, where it may remain for hours. The interruption in the circulation of the blood favors infection of the weakened tissue. For disinfection, hydrogen dioxide, followed by thymol-alcohol, is recommended.—*H. Pichler (The Dental Cosmos)*.

CEMENT FOR MENDING PLASTER CASTS.—The following makes a reliable cement for mending broken plaster casts: Dissolve celluloid in acetone to a syrup consistency. Smear the fractured surfaces and press together for a minute or two. It dries quickly and holds securely.—*Pacific Dental Gazette*.

THE USE OF FLOSS SILK IN THE DENTAL TOILET.—In the use of the floss silk, one should first rub tooth-powder into the dental interspaces and then pass the floss gently down to and under the gum margin of one tooth without forcing into it so as to produce mechanical injury. The floss should then be bent as nearly as possible half-way around that particular tooth, and then with a slight sawing motion be slowly wiped over the entire approximal surface and part of the buccal and lingual as the floss is drawn toward the occlusal and out between the teeth. Next the floss is passed into the same space, and the adjoining tooth cleansed. The performance of the act once a week should be supplemented by the use of a thin rubber band nightly, as it is soft and less injurious mechanically than the floss.—*(Dental Record)*.

ORAL HEALTH

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Vol. VI.

TORONTO, MAY, 1916

No. 5

EDITORIAL

Recent Dental Legislation in Manitoba.

A COPY of the amendment to the Dental Act of Manitoba has reached us, and a careful perusal of this new legislation cannot but force the conclusion that our western brethren have taken a decided step forward. The new Act, as it now stands, will compare most favorably with those of other provinces, and the dental profession of Manitoba, while perhaps not gaining all they wished for, are to be congratulated on the general outcome of their legislative efforts.

The outstanding features of the new Act may be summed up as follows:

- (1) The preliminary examination hereafter required is restricted to "Matriculation in the arts faculty of the University of Manitoba or an academic standing which, in the opinion of the Council, is equivalent thereto."
- (2) Power is given the Board of Directors to establish and conduct a school of dentistry by itself or in conjunction with the University of Manitoba.
- (3) The University of Manitoba is to be the sole examining body in dentistry in the province.

- (4) Graduates of recognized colleges applying for examination shall receive a permit to practise in the office and under the supervision of a regular practitioner till the next succeeding examination held within one year. However, no such permit shall be renewed thereafter.
- (5) The regulation and discipline of the profession is made more stringent and is gone into in more detail. For example, it is defined a misdemeanor "To in any way advertise to practise dentistry in all cases without causing pain."

X-Ray Plates May be Shown to Juries.

THE Supreme Court of North Carolina, in affirming a judgment in favor of the plaintiff for damages for personal injuries alleged to have been caused by having a heavy truck pass over one of his feet, holds that there was no error in permitting a physician who had made skiographs of the plaintiff's feet to exhibit the plates to the jury. It was true that the witness who made the skiographs did not say in so many words that the photograph was an accurate and true representation of the condition of the foot, but this was a reasonable inference from his evidence.

This decision is of interest to members of the dental profession, and is but one of the many future developments in dentistry resulting from the use of the X-Ray. Under the circumstances where there is any uncertainty about the treatment, a skiograph is essential both from the patient's and operator's standpoint. Some writers would have us believe that the X-Ray is nothing but a "shadow of doubt." However, when the dental skiograph is introduced to a jury it becomes a decided reality, and while it may be a "shadow picture," it will, we venture to think, be considered by the jury as a most important piece of evidence.

Good Public Service by Mayor Cowan.

IN the midst of Mayor Cowan's activities as Mayor of Regina he finds time to devote to the best interests of the dental profession.

Aside from his interest in recent legislative enactments in the Province of Saskatchewan, he has had incorporated in the *Regina Municipal News* (5,000 copies of which find free distribution in the city of Regina) an excellent article on oral hygiene. The article appears under the Department of Health News.

Canadian Dental Association.

THE next regular biennial meeting of the Canadian Dental Association will be held in Montreal on September 12, 13, 14, 15, 1916. A large number of Canadian dentists have gone to do their bit in the great European conflict. Others expect to go during the coming summer. It is earnestly hoped by the executive committee that all those of our numbers who can do so will make a point of attending the coming meeting. An excellent programme is being prepared, and September is an ideal month in which to visit Montreal, Quebec and the mighty St. Lawrence.

Donations Canadian Army Dental Fund.

THE following donations have been received by Dr. Snelgrove, 105 Carlton Street, Toronto, Treasurer Canadian Army Dental Fund, since the last acknowledgment:

New Brunswick—

Dr. J. C. Leonard, St. John	\$10 00
Dr. A. L. McAvenney, St. John	5 00
Dr. J. L. Day, St. John	5 00
Dr. F. S. Sawaya, St. John	5 00
Dr. L. A. Langstroth, St. John	1 00

Ontario—

Dr. C. N. Simpson, Port Arthur	5 00
--------------------------------------	------

In addition to the above, the Wingate Chemical Company donated fifty tubes of anocain. The Quebec Dental Society paid \$250.00 direct to Major Clayton for the benefit of the C.A.D.C.

Toronto Dental Society.

TREASURER'S STATEMENT, SEASON 1915-1916.

J. E. RHIND, TREASURER.

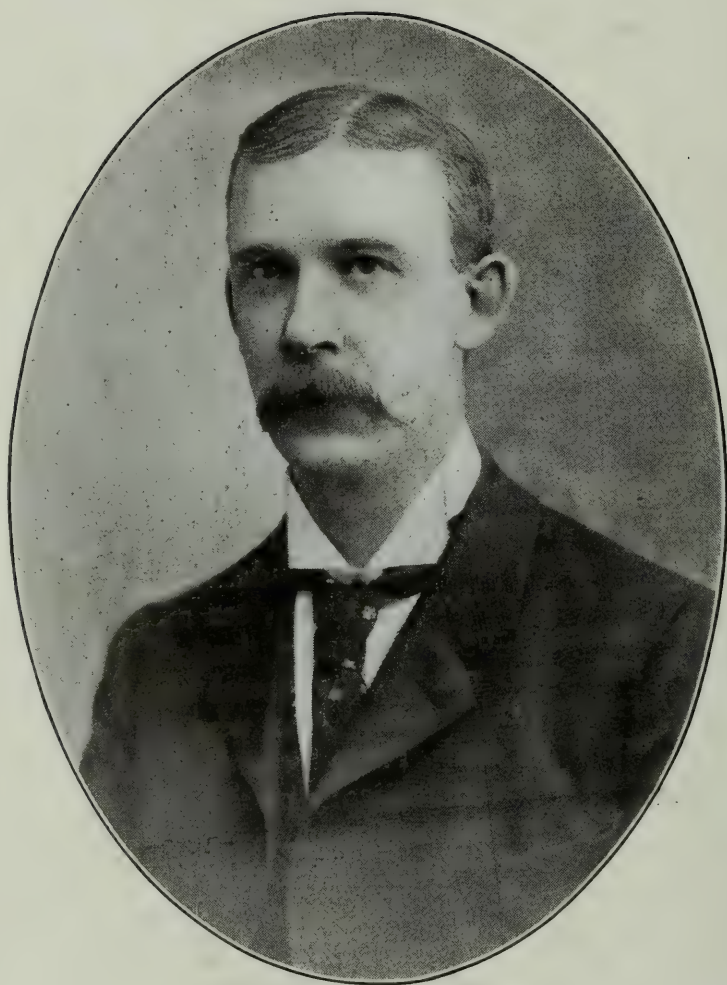
Receipts.	Expenditures.
1915.	Essayists' expenses and
March 22.	Hotel Carls-Rite for sup-
Balance from last season.. \$197.05	pers for 4 meetings \$391.70
131 Membership Fees 655.00	Printing
Visitors' Fees	Postage and Typing
Bank Interest	Floral Wreath
	Sundry small accounts ..
	Cash Balance in Bank
\$865.07	\$865.07

April 10th, 1916. Audited and found correct.

(Signed) B. F. Nicholls.
W. E. Willmott.

From the Billet Door.

JOHAN PRINGLE, Chaplain of No. 3 Canadian Field Ambulance, has written a masterly article, entitled "From the Door of My Billet." The following are extracts: "This war has made us alive. The only thing worth while in the world's life grows in the soil of sacrifice. We have been aroused from our lethargy, and shaken out of our easy-going, luxurious, and pleasure-loving ways, begotten by accumulated wealth and almost unbroken prosperity. It has organized our people, speeded up their industries, exalted their virtues, shown up their vices as national weaknesses, taught us anew the old lessons that man does not live by bread alone, that right is our vital breath. And what a 'mixer' this war has been! Here we are all living—officers and men—practically on the same level, in billets, dugouts, huts, and veritable shacks. Here manhood counts. Human brotherhood is a real thing here. The effort and the sacrifice will school our people out of their easy-going, indolent habits, give a new value to democratic government, a new vision of the purity without which true democracy is impossible."



DONALD CLARK, L.D.S., D.D.S., Hamilton
Member Board of Directors Royal College
of Dental Surgeons of Ontario.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, JUNE, 1916

No. 6

Soldering and its Difficulties

INVIN H. ANTE, D.D.S., TORONTO.

IN its application to dentistry, soldering has assumed the significance of an art of much greater importance than ever attained by the gold or silversmiths. However, the ease with which good results are obtained by the more skillful, when compared with the discouraging failures of others (such as the burning or fusing of the parts or the fracture of porcelain facings), leads to the conclusion that the lesson has not yet been learned by many men. One should closely apply oneself in an effort to become so skilled as to render the procedure one of simplicity and ease and reduce to a minimum the attending danger of accidents.

The essential requirements for successful soldering are:

1. Cleanliness of the surfaces.
2. Proper flux.
3. Apposition of surfaces.
4. A free flowing solder.
5. Proper amount and distribution of heat.
6. Proper support.

CLEANLINESS.

Cleanliness should always be strictly observed in soldering operations. The surfaces to be united should be bright and clean in order that the solder may become thoroughly attached. This can be secured by filing, scraping, polishing, and by treating the metal in the acid bath.

ACID BATH.

Sulphuric acid, diluted with equal parts of water, is frequently

used for this purpose. The parts are immersed for a few minutes to remove all oxidization or deposits of foreign character. By heating the acid bath, its cleansing properties are increased. After removing the work from the acid, it must always be freely washed in clean water. If any acid should remain, when the work is heated, salts are formed of the baser metals, which prevent the possibility of soldering until the parts are again treated with the acid and this precaution observed.

PROPER FLUX.

Oxidization will always occur with gold that has been alloyed with baser metals, due to the affinity of the baser metals for oxygen, taken from the atmosphere. This tendency is increased by heat. It being necessary to prevent oxidization and maintain cleanliness of the parts, different substances are used for this purpose. Borax employed as a flux and fused over such surfaces dissolves the oxide which forms on the surface, while it also protects from further oxidization by excluding the oxygen of the atmosphere. It also aids in the fusing and alloying. The solder should also be smeared with borax, because, being a lower grade alloy it is more easily oxidized. Borax is most frequently used as a flux and meets the requirements in every respect. For convenience, the rock or prepared borax is used. Make a saturated solution of powdered borax and boric acid in water, the solution being kept in a glass bottle with a dropper top. A little of the solution is placed on a ground glass slab or slate with the rock borax, and with a circular motion rub until a thin paste of flux, of a creamy consistence, is produced. This is applied to the particular surfaces (before heating the parts) in very small quantities, with a camel's hair-brush or tooth-pick, carrying it to every portion and surface upon which the solder should flow.

WAX.

All parts that are to be exposed for soldering should, previous to their investment, be thoroughly covered with wax. This will effectually exclude plaster and is easily removed, with boiling water, after the investment has sufficiently hardened, thus producing clean exposed surfaces. A sticky wax, the writer has found very satisfactory, is made of resin two ounces, beeswax one ounce, Venice turpentine one teaspoonful. Melt in order named, thoroughly melting each before adding the other. Mix thoroughly by stirring and pour into moulds.

APPOSITION OF SURFACES.

To facilitate the union between the parts, the edges or surfaces should be in absolute contact. If any defects of this character are found to exist, they should be remedied by filling such spaces before the case is heated, with small pieces of metal of which the work is being constructed, thus rendering the continuity of the part complete.

Solder runs freely by the force of capillary attraction, between two closely-fitted surfaces, just as water between two pieces of glass.

HEATING AND SOLDERING.

The application and proper manipulation of heat in securing the best results is an important feature and a matter requiring both care and judgment. The under-valuation or over-estimation of the required heat is frequently the means of much discouraging labor. Yet when the principles are properly applied and observed, the entire procedure is quite simple. When soldering bands, cusps, etc., and no investment is necessary to sustain the relation of the parts, the work is more easily accomplished; but when investment is used, the process is a somewhat more difficult task.

The case should always first be placed upon a bunsen burner and gradually heated to exclude all moisture from the investment, and left in place long enough to become thoroughly heated (15 to 30 minutes), which point is indicated by a dull red color.

SOLDER.

The solder used should possess the quality of flowing freely and be as high in grade as the attainment of that property will permit, so that it will sufficiently resist the action of the fluids of the mouth. It should also approximate as nearly as possible the color of the metal upon which it is used. For convenience, solder should be in plate or strip form, about twenty-six gauge, and cut into sizes corresponding to the extent of the parts to be united. A small piece of high grade solder (such as 20k) should be placed near the top of each joint where backings come together, and also at the point of union between backings and cusps or plate. If facings are used, a piece should be placed over the pins just large enough to cover facing. These pieces of solder are made to adhere to their proper position through the agency of the flux. The excess solder for filling in the work, which may be of a lower grade (18k or 20k), is cut up into suitable sizes or in strip form and kept in readiness on the borax slate or glass, where it will be handy for further use when finishing the soldering operation.

HEATING UP.

With the brush flame from the blow-pipe the temperature should be raised very gradually, in order that the pieces of solder may not be displaced by the puffing-up (incident to the calcination of the borax), or that the facings or porcelain teeth may not be fractured by too sudden an elevation of temperature. All parts should be brought to an equal temperature. Should one part become sufficiently hot while the other remains comparatively cool, the solder when fused will flow upon and adhere to and have a preference for the hottest portion. The brush flame from blow-pipe should, as a preliminary step, be directed to the under surface and around the case—especially upon the heavier metals or bulky parts, as crowns, saddles, facings, inlays, etc.

SOLDERING.

When the case is thoroughly heated and the temperature raised to the fusing point of the solder, the small pieces of solder previously placed upon the surfaces will begin to fuse and settle down. The oxidizing or pointed blue-flame of the blow-pipe should now be directed upon the solder and each layer is thoroughly fused before adding more. The excess solder is consecutively applied in fairly good sized pieces or long strips, until the case is filled in and the restoration of contour is obtained.

The fusing and flowing of the solder in the desired location and direction may be facilitated by using the sharpened point of a slate pencil, bicycle spoke, or hat-pin to pull, push or guide the solder (when in the fused or plastic state) to the desired point, after which only sufficient heat to smooth the surface should be applied.

COOLING.

When the soldering has been completed, the case should remain over the flame for a few moments to prevent too rapid cooling and the consequent sudden contraction or shrinkage. The flame may then be turned off, and if porcelain facings are present, the case is embedded in asbestos fibre, plaster or pumice and allowed to cool to the point where it may be comfortably handled. It may then be removed from the investment, cleaned in acid and finished.

SOLDER "BALLING-UP."

Solder "balling-up" is invariably the result of the heat or flame being directed upon the solder before the surrounding parts are equally and sufficiently heated to permit of alloying. A poorly alloyed solder will also ball up, even though the case be sufficiently heated; this is indicated by dark or copper colored streaks running through the solder. When solder balls-up and the heat is continued upon it, the baser alloys contained in it (zinc especially) may be burned or volatilized out. This loss will increase the fusibility and decrease the flowing properties to such an extent as to cause the melting or burning of the parts. When solder balls-up, remove the flame, thoroughly flux the balled-up solder, and cover over with fresh pieces of solder, well smeared with flux, apply the heat and observe the suggested precautions.

BURNING.

The fusing or burning of parts is the result of too much heat being directed upon the work after the solder has begun to fuse; or overheating one particular part by the flame being directed and held too long upon it. This latter being a common result when one is trying to flow solder upon a dirty surface.

If the work be melted (which is indicated by the presence of small or large perforations in the surface of the work) it will be necessary to resort to some means of filling-in or repairing. This is best accomplished by what is known as the sweating process. Small perfora-

tions may be filled in this way by first thoroughly cleaning the surface by scraping or filing, flux thoroughly and then place in position a piece of solder somewhat larger than the perforation, and with an oxidizing flame from the blow-pipe apply to the parts around the solder. Heat until the solder settles down, then apply the flame direct until it becomes firmly attached without complete fusion. When the perforations are too large to bridge over with solder, a piece of pure gold plate (backing) of suitable dimensions is fitted and bur-nished into the opening, and the surrounding surfaces cleaned and fluxed. The solder (well fluxed) is placed in position covering the same, and with the same procedure as indicated above, the operation is completed.

UNSOLDERING.

It is frequently desirable to observe certain precautions to avoid the unsoldering of the parts previously united, such as the seams on bands or the cusps and band. This is easily prevented by coating such surfaces with prepared anti-flux or solution of whiting or plum-bago in alcohol or water. As a preliminary precaution such joints or seams should be soldered with a higher karat solder, 22k for instance.

SMALL HOLES.

The presence of small holes or perforations on the surface of the metal is not an unusual occurrence. This may be caused by the presence of baser metals (lead, tin, zinc, etc.), which may become attached to the gold by contact with the dies in swaging, the bench, or from a file containing the same. This may be avoided by heating the pieces in an acid bath (equal parts sulphuric acid and water) immediately preceding the heating of the metal. Perforations or borax holes are common on soldered surfaces. This is largely caused by the borax being retained between the layers of solder and incomplete fusing of same. To avoid, use a minimum amount of borax—the liquid rather than the dry. Also during the process of soldering, thoroughly melt or fuse each layer of solder before adding more, and the final layer should be thoroughly fused so as to produce a smooth, unpitted surface. Lower karat solders pit more easily than the higher, due to the presence of a greater amount of baser metal.

SHRINKAGE.

It is necessary to use the utmost precautions toward preventing the possible change in the relation of the parts, which would interfere with the fit and adaptation of the work. The shrinkage of gold solder increases in proportion to the quantity of baser alloys incorporated. Thus the lower the karat or grade, the more shrinkage. In extensive work it may be further prevented by first soldering the parts separately, then in the final assemblage of these parts very little solder is used to secure union and strength. Very large bridges should be divided and soldered in sections and then subsequently uniting the sections.

In the assemblage of heavy posterior bridges, where a great bulk of solder is used, it is always desirable to carry to the deep portions of the work as small a quantity of solder in the melted state as is possible at one time. The bulk may then be filled in with copper, brass, German silver, scrap gold, platinum wire, gold wire, or gold-filled or gold lingual bar wire, the latter being preferred. Then thoroughly cover over with the gold solder. The value of the use of these in this manner is in order to minimize the shrinkage.

The change in the relation of the parts, caused other than by shrinkage or carelessness in investing, is rare. The few minutes that might be expended in verifying the relation of the parts may save hours of work. If the investment cracks when heated, the parts may be held together with measurement wire if one is sure of the correct relation, or the work is allowed to cool, and sticky wax is flown into the bridge parts. Then break off the old investment, verify the relation of the parts by returning to the original model and then reinvest the bridge in a good investment. The cusps of a posterior bridge may, during the process of soldering, draw from their correct position, owing to the shrinkage of the solder. This may be overcome by placing an L-shaped strip of gold (about 3mm. wide and 10mm. long), hooking the small or top end of the L around on to the lingual surface of the cusps and the other end extending into the investing material.

CONTOUR.

The proper contour is rather hard to determine, but with a little experience in soldering it becomes quite easy to produce the desired effect. When soldering, it is always desirable to observe the laws of gravity, for while it is true that solder will follow the heat, its flow may be so controlled only in the smaller cases. When used in large quantities, especially in large cases where the curvature is great, its weight will naturally cause it, when fused, to seek the lowest point. Thus the position of the work should be changed as the soldering progresses in order to retain, in the desired location, the solder mass when it is in the fluid state. The use of reinforcing wire (as suggested under heading "Shrinkage") will also be found advantageous. A piece of plate gold may be so shaped and fitted into the bridge to produce the desired contour and inserted during the process of soldering.

FRACTURE OF PORCELAIN.

The difficulties most frequently experienced in the checking or fracturing of porcelain during soldering is, in nearly all cases, due to most trifling mistakes. A facing is made of two distinct substances, the porcelain and the platinum pin, each of which possesses physical properties differing when subjected to heat. The porcelain absorbs heat very slowly, while the platinum absorbs it very rapidly. Thus the heat must be applied gradually and uniformly in order that the expansion which takes place in each may occur evenly.

When fractures occur across the surface of facings mesio-distally, they are invariably caused by too sudden elevation of temperature, such as the oxidizing flame of the blow-pipe being directed upon the facing before the solder has started to flow. This causes a rapid expansion of the platinum pins, and the expansion of the porcelain being not sufficiently rapid to accommodate that of the pins, the facing is cracked across its surface.

Longitudinal fractures on the mesial or distal edges, or the scaling off of the porcelain face, may be from impingement caused by the shrinkage of the solder and by too close adaptation of the facings or parts to each other. Scaling off of the porcelain face may also be caused by carelessly bending the pins (to retain the backing) in such a manner as to produce a constant strain on the porcelain surrounding their attachment. Always file the pins about half way through on the opposite side to the direction you wish to bend them. Small checks in the porcelain along the incisal edge may be from overhanging edges of the backing tips or cusps or an excessive amount of flux used. The contraction of these cause an impingement upon the edges of the facing, which results in checking. The backing should be filed flush with the edges, and the cusps or tips be so adjusted to form a butted joint.

Fractured facings are also caused by faulty adaptation of the backing to the facing, or the perforations in the backing being much larger than necessary for the reception of the pins, thus permitting the solder or flux to run in between the backing and facing, the contraction of which may fracture the porcelain. The backing surrounding the pins should be burnished closely to same and adapted to the facing with some form of swager or press. It is also claimed that many of the facings are checked during the process of manufacturing them. These, of course, we are not responsible for.

BURNING THE COLOR OUT OF PORCELAIN FACINGS.

Destroying the coloring matter in facings is very rare in most of the porcelains that are on the market to-day, but in some makes of teeth the color is very easily destroyed. It may be caused by a long and continued heating at a high temperature, or an excessive amount of Portland cement being used in the investing material.

SUPPORT FOR WORK.

When soldering with the flame of a blow-pipe, it is necessary to perform the operation upon a support made of some suitable body. Supports are of two types, namely, blocks composed of charcoal, asbestos, or magnesia, and appliances serving the double purpose of holder and heater. The charcoal block is best for certain cases. It adds to the heat of the blow-pipe flame and thus aids in the fusing of the metal. It is the most suitable for small work, the only disadvantages being that it is black and brittle. These disadvantages, however, may both be overcome by encasing with tin and set in

investment material. The charcoal is rapidly consumed. The asbestos block is clean, durable and fireproof, but otherwise has nothing to commend it. The magnesia block is compact, clean, quite durable, and so soft that some forms of work may be embedded in its surface and thus be better supported. Invested work is often supported by embedding into asbestos fibre, pieces of coke, pumice stone, fire clay, or chunks of investment material placed in a pile on an asbestos pad.

The combined support and heating appliance is, however, the most commonly used. The work is placed upon a piece of iron gauze (metal lathing) and then placed upon the spider over the flame of a bunsen burner. A very simple, most useful, and economical support is to line the sides of a small granite or aluminum saucepan (4 inch diameter by 2 inches deep) with sheet asbestos. Punch small holes in the bottom to allow air to enter for combustion. The work is embedded into pieces of coke or pumice about the size of marbles held in this dish. The handle on the dish is used to turn or tilt it during the process of soldering, without disturbing the case. After the soldering is complete, the case remains in the dish and is allowed to cool.

Post-Graduate Class in Dental Prosthetics

AT the request of the Dean of the Medical College of Virginia, and for a number of other reasons, the place of meeting of the annual class in dental prosthetics will not be Toronto, but the charming southern city of Richmond, Virginia, a little over a night's run from Toronto. Following the increased amount of extraction of teeth as shown necessary by the X-Ray, and the resulting change in the sanitary and engineering aspect of these mouths, and the design of restorations for these, has led to a remarkable demand for information, especially as touching partial dentures. Dr. Cummer, whose lectures, demonstrations and models in partial dentures are exceptionally complete, and embrace some fundamentals in design new to many, is under arrangement to present this subject in Salt Lake City, Utah; Portland, Oregon; Spokane, Wash.; San Francisco and Los Angeles, California, before meeting the class in Richmond, and subsequent to that before the Ohio State Dental Society, Dayton, Ohio, in December. The course in Richmond will be given in the early part of August, and will be an opportunity for those interested in the prosthetic side of dentistry. Those interested would do well to communicate with Dr. J. A. C. Hoggan, c-o Medical School of Virginia, Richmond, Va., U.S.A.

Partial Dentures

W. E. CUMMER, D.D.S., L.D.S., PROFESSOR PROSTHETIC
DENTISTRY AND APPLIED DENTAL PHYSICS, ROYAL
COLLEGE OF DENTAL SURGEONS, TORONTO.

(Continued from April issue)

IMPRESSIONS.

THE Greene method of impression, with its modifications, is pre-eminently the scientific and effective method for edentulous cases, and while the exact result in peripheral adaptation and non-interference with muscle action is of paramount importance in securing maximum adhesion and comfort in the above, yet in the many partials even in which retention is provided mechanically, and in which adhesion is not of paramount importance, the principle of muscle trimming is of advantage. For cases involving the posterior teeth, with most or all the natural anteriors standing, the tray may be cut away over the anteriors, the impression made and muscle trimmed, and after finished, the labial surfaces "cored" in with an additional piece of compound laid across the front of the teeth and pressed in with the lip, with the main impression in place. (Fig. 30.) In all cases of

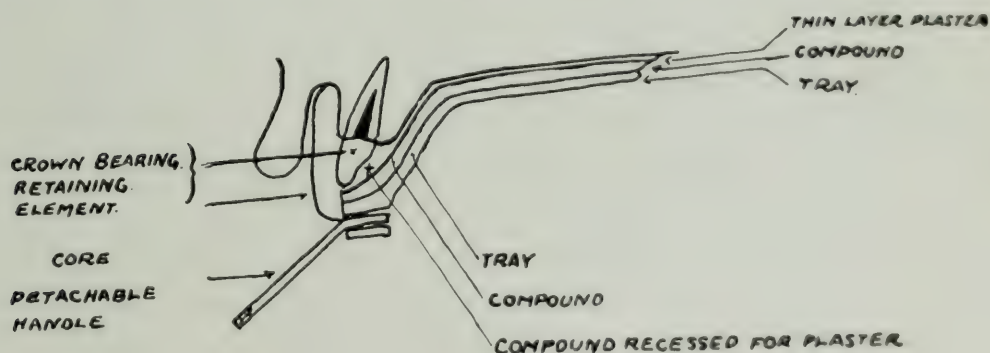


FIG 30.

Figure 30.—Showing section of a muscle trimmed compound impression with core, and thin film of plaster for partials (see Fig. 15) in which adhesion is desired as an auxiliary retaining force.

teeth to be fitted, with abutments of any description present, the compound should be cut away and a thin layer of plaster introduced, having the patient raise the tongue and move lip and cheek to prevent plaster covering already muscle trimmed periphery. The impression having been made each crown, post and cope, etc., drawn with it should be given a layer of soft wax or oil which will allow its easy withdrawal from the cast. In most cases, other than such as above, plaster is indicated, either by entire or sectional method.

CAST AND ANTAGONIZING CAST.

Weinstein's, Spence's plaster compound or sorrel stone makes a model approximately four times as dense as plaster, a decided advantage. The materials should be thoroughly spatulated to a consistency of putty, and packed in with wooden sticks into the recesses in the impression made by the teeth. For antagonizing casts in which correctly made full dentures, dentures and natural teeth, and natural teeth alone nothing is as good, following a method of Dr. R. Gordon

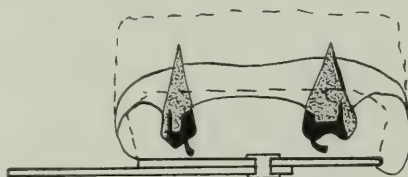


Figure 31.—Method of Dr. H. E. S. Chayes, of New York City, in fitting impression bearing inlays crowns, showing varnished and oiled impression, inlays (with uncut sprues) with one shape cement processes built out into space; plaster subsequently added to dotted line.

McLean, as a plaster impression half way down the necks of the teeth into which may be poured Melott's metal almost before the plaster is set. In articulating, the interfering points of porcelain blacken from the Melott's, acting in the same manner as carbon paper, and is a great convenience.

Should plaster be used for casts, all the precautions against expansion, non-overstirring, non-use of K2 S04, no delay in pouring of plaster impression, thick heavy cast, subsequently cut down, etc., should be observed. Portions of the impression bearing crowns, posts, and copes, inlays or similar after these are waxed or varnished sufficiently to form a film of intermediate material, may be packed with cement with cone processes reaching into space prior to the filling with plaster. (Fig. 31.) The cast having been poured, slight heat, sufficient to melt varnish or wax, allow easy removal of inlay, post and cope, etc., and accurate and frequent replacement. In instances of large saddles in which reswaging is indicated, the use of first named series of materials is indicated.

BASES.

For the saddles of partial dentures, gold is the material which conforms to the requirements in the very best sense, susceptible of a high polish, capable of assembly with solder, thus occupying a minimum of space, and of sufficient strength, properly alloyed, for unobtrusively formed parts. For small saddles of six teeth and under, casting by the indirect method is expedient, using a thin wax of 28 gauge, applied carefully to cast, covered with French chalk, rubbed in, preventing adhesion, wire rim retainers space for Gilmore attachment, etc., all worked in in the wax, as well as suitable gates and air escapes (the writer would like to mention the Mathews Wax-Wire Former in this connection) (Fig. 32), and this half-invested. The

half-invested and thus stiffened wax may be lifted from the model, the investing completed, and the saddle cast (Fig. 33) and returned to the model for assembling with the retainers, rests, etc., necessary to complete the base of the partial denture. Aluminum may be used in a similar manner, different in that ordinary base-plate wax may be used, which is of sufficient rigidity to be mounted directly with one operation on the sprue wire; but the attachments must be made of rubber, and the saddles heavier, making a more

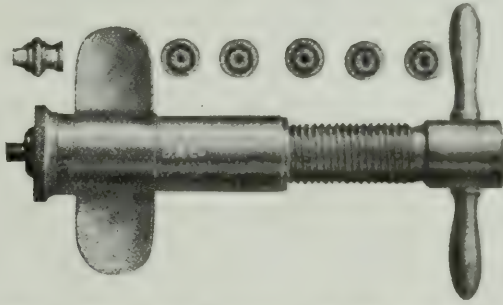


Figure 32.—Mathew's wax wire former, a most useful laboratory accessory. To be filled with wax, warmed over flame, and on insertion of various nozzles, shown above, wax in wire form of corresponding different sizes and shapes, round, oval, etc., is readily expressed. It is interesting to note that manufacturers are planning to give us wax in various shaped and sized rods for casting

obtrusive if less expensive part. In the mind of the writer the above process for casting aluminum is so quick, easy and cheap that rubber bases need seldom, if ever, be used, a decided gain in sanitation.

SIZE, POSITION, ETC., OF BARS, INDIRECT RETAINERS, ETC.

Regarding the size of 18k stiff oval bar used in joining the saddle elements of partial dentures, etc., from 6 x 12 to 8 x 13, Brown and Sharpe gauge, depending on the amount of leverage, large or small stress given by the patient, etc. Concerning the position of the lower bar, the least obtrusive position has been found as low down as the muscles of the raised tongue will permit without chafing; in a cast made from a muscle-trimmed impression at the lowest point behind

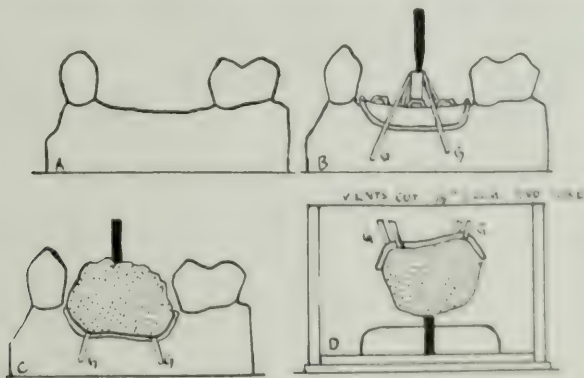


Figure 33.—Steps in investing saddle by indirect retention. (a) Cast, covered with French chalk rubbed on. (b) 28 gauge wax laid down, wax wire rim, retainers, gates and vents in position. (c) Ditto, half invested (investment applied with camel hair brush).

the alveolar process and 2 mm. back, and inclined the same direction as the lingual surface (Fig. 34A). This may be easily done by cutting a tinfoil pattern (Fig. 34B), straightening this out on a flat surface, and bending (Fig. 34D) the oval bar against the wider cross-section to a position corresponding to the pattern, then completing the bending against the small cross-section, giving the adaptation shown in Fig. 34A. As compared with Fig. 34E, bent against narrow cross-section only. Sharp right angle bends are accomplished by cutting a 90 degree angle in the bar, bending up, apply flux and small panel of solder, and soldering over bunsen. Angles less or more than 90 degrees may be found by cutting the angle complementary to 180 degrees in the bar bending over, and soldering in like manner. (Fig. 34 F, G and H.)

The size of the upper bar varies as to its requirements similar to the lower, and its position is touching the upper vault, except for a millimeter or less over the hard central area allowing for "settling"

CUTTING AND BENDING OVAL OR ROUND BARS.

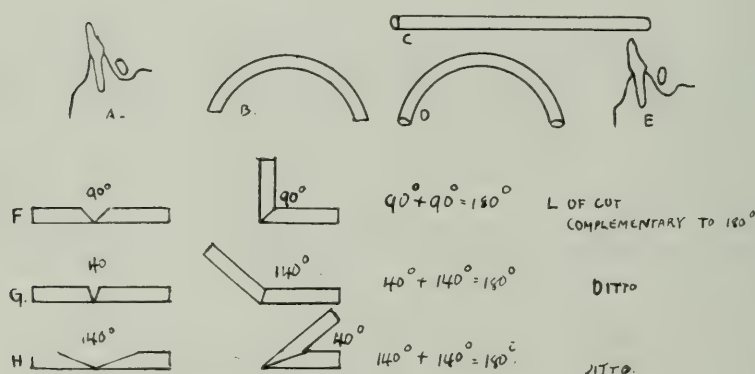


Figure 34.—Bending and cutting oval bar for various curves, angles, etc. (a) Position of lingual bar. (b) Tinfoil pattern, cut and fitted against model, then flattened. (c) Oval bar unbent. (d) Oval bar bent against widest cross section to tinfoil pattern using pliers. When the bending is finished against narrow cross section the bar will assume form in Figure A. (e) If bar is bent in one way only against narrow cross section it will assume shape in Figure E.

Rule: File or cut angle complementary to angle desired.

F.— 90° angle (right), desired cut 90° angle, bend to 90°

G.—140° angle (right), desired cut 40° angle, bend to 140°

H.— 40° angle (right), desired cut 140° angle, bend to 40°

and coming about opposite the second molar is as far back as possible, keeping about one-quarter inch ahead of the soft palate. Should construction call for bar further forward than this, a half-round section or flat section of two thicknesses of "sweated" metal should be used (Fig. 34, 35 and 29F). For wire for joined indirect

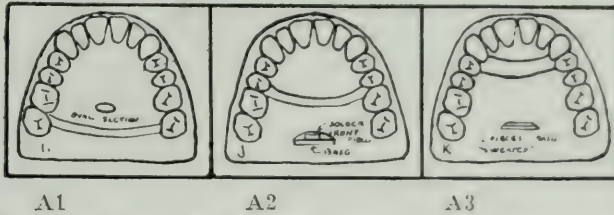
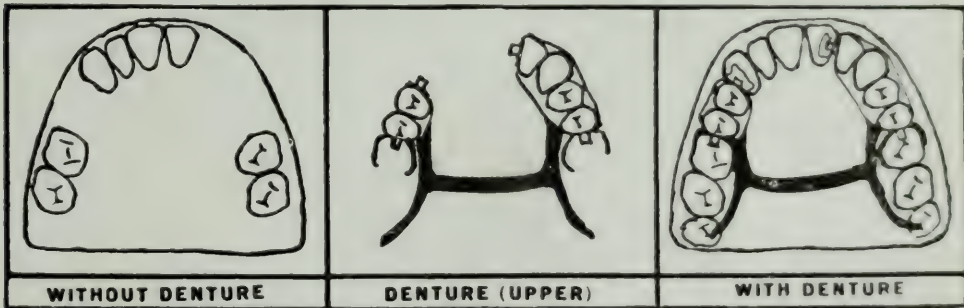


Figure 35.—Size and shape of upper bar.

A1, A2, A3.—Suggestions for constructing bars in different positions of upper mouth.



B.—Restoration with upper bar opposite second molar.

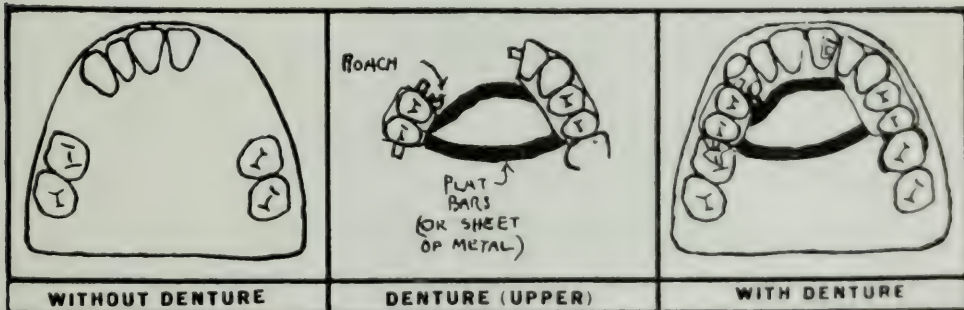


Figure C.—Same restoration, keeping all construction ahead of first molar. Bars A2 or A3 might be used, or one sheet of 26 gauge gold.

retainers, clasp to base, Roach split-tube, etc., a 14-gauge B. & S., rolled slightly, answers well.

Care must be taken in bending the indirect retainers to keep them away from the gingival (Fig. 29E).

NOTE.—Often bars, indirect retainers, etc., may be unobtrusively placed in between rugae.

ASSEMBLING OF METAL PARTS.

The various parts as retainers, rests, saddles, bases, etc., having been united (using ground asbestos wet (Neutralite), or the Ivory soldering pliers (Fig. 36) for parts not requiring exact relationship, as the wire on the Roach split tube, the 14-gauge wire on a clasp,

etc.), assembling these partly assembled pieces with wax (always heat pieces to be waxed together and flow wax thereupon before waxing together, thus preventing separation), and investing with a standard investing material. This having been satisfactorily com-



Figure 36.—Elliott soldering pliers and stand, a useful adjunct for rapid soldering without investing small parts, as clasp on 14-gauge wire, Roach attachment to inlay, split tube to 14-gauge wire, etc.

pleted, and its accuracy checked frequently and finally by trials in the mouth, held together by both wax and subsequently solder, wax trial plates may be built down, and the process of "taking the bite" begun.

TAKING THE BITE.

Unless there are a sufficient number of upper and lower natural opposing teeth with defined occlusion in contact, making possible the accurate placing of the casts in the position of the rest bite, trial plates with built down wax rims are necessary. In most cases, details associated with full cases, as amount of separation of the ridges, median line, facial contour, etc., are already supplied by the teeth,

and the first step is usually the securing of the rest bite, also simplified by the presence of teeth as land marks. The next step, the placing of the models in the anatomical articulator, is accomplished very easily by either the Snow face bow, or the Gysi registering instruments (the latter which serve to trace the condyle path, lateral movement, etc., and rotation point tracing). (P. 171, etc., Clapp Prosthetic Articulation.) In the Snow face bow bite stem No. D (Fig. 37), the lower may be fastened to the articulator first, the face bow

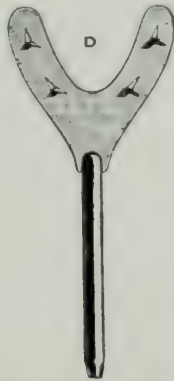


Figure 37.—Stem No. D. Snow face bow.

and stem removed, and the upper fastened to the lower by the indents in the upper trial plate, from the natural teeth. With Professor Gysi's instrument (horseshoe plate) the process is the same. (P. 189, Clapp Prosthetic Articulation.) The ascertaining of the inclination of the condyle path, lateral movement, and position of the rotation points may be obtained from patient and incorporated in the articulator, so far as the writer's knowledge goes, only by the registering apparatus and adaptable articulator of Professor Gysi's.

ANATOMICAL ARTICULATION.

Nowhere is the observance of established principles relating to the movements of the jaw and harmonious arrangement and formation of the teeth of more importance than in the construction of partial denture—removable pieces. Interferences of porcelain in side movements of the jaw in mastication has resulted in the failure of many an otherwise perfect piece of work, as has non-interference of porcelain or gold accounted for at any rate the comfort of other fearfully shapeless pieces of restoration. (Figs. 38 and 39.) The correct registry and reproduction on the articulator of the condyle path, and more important than that, of the lateral movement and rotation centres as well as correct placing of casts in articulator is of utmost importance, and furthermore, even with the Gysi system, is simple, adaptable to all cases, and within the reach of any average practitioner, and eliminates possibility of failure from this source. (P. 171, 172, etc., Clapp Prosthetic Articulation.)

The condyle path may be secured by the protrusive bite in event of lack of the Gysi registering frame.

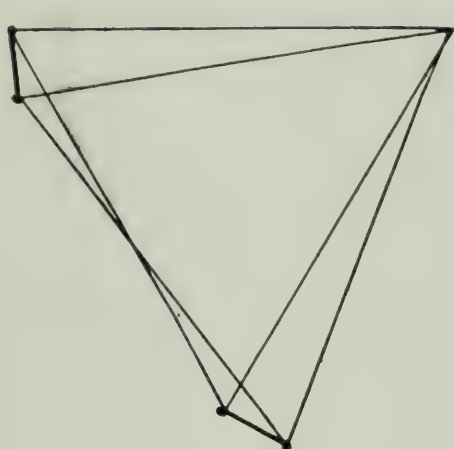


Fig. 38A.—Incorrect.

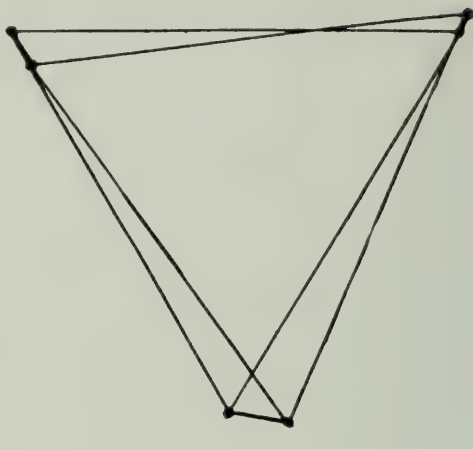


Fig. 38B.—Correct.

Schematic representation of the correct and incorrect theories regarding the movement of the mandible at the condyle during lateral movement referred to in text. It has been supposed that when the jaw was swinging to the masticating side that it was simply swinging in a rotary movement with the opposite condyles as centre. Professor Gysi has shown this to be incorrect, and that in the lateral mastication movement the whole mandible moves inward laterally as well as forward, while on the other side the condyle, instead of merely rotating (Fig. 38A), moves slightly outward (Fig. 38B). See also Figs. 39A and B.

Fig. 38A shows rotation point 13CM. apart from the greatest distance, and to the distal. In a side movement, say towards the left of the page, the jaw is swung, not from the condyle, but at the left hand R, the rotation point. The condyle nearest it takes the short path, the ends of which are joined to the two short radii running from R, and the condyle farthest away from R follows the longer paths, the ends of which are joined by the two longer radii from R. The heavy lines, therefore, denote the travel of the condyle in the glenoid fossae. Note also the oblique lines running from the centre of the teeth themselves, which represent the travel of the upper lingual cusps in side movements. In a side movement towards the left of the page, the lingual cusps on the upper on the right side of the page would describe areas obliquely forward on the occlusal surfaces of the teeth on the right side of the sketch, while on the masticating or side nearest the rotation point the cusps of the upper travel buccally through the intercusp spaces. Fig. 38B is similar to Fig. 38A, except rotation points on 7 cm. apart instead of 13 cm. If the mandible swings say to the left of the page, the jaw swings from the left hand R or rotation point, and on the left side the condyle describes the short arc of the circle with R as centre, joined at each end by the two short radii; while on the other side the condyle travels forward, describing the arc touched at either end by the longer radii from the left hand R. Note in Fig. 38B the difference of the cusp travel in the two lines described by the lower cuspid, one with rotation points at 7cm. and the other at 13 cm. Note also that with widely separated rotation points and forward travel of the cusps of lesser obliquity as in Fig. 38A, admits of greater cusp height and overbite, as shown by small sketch at side of the page, while in Fig. 38B, with rotation points close together, the forward of the upper lingual cusps in the masticatory groove of the lowers is more strongly oblique, necessitating lesser cusp height and overbite, as shown at the side of the diagram.

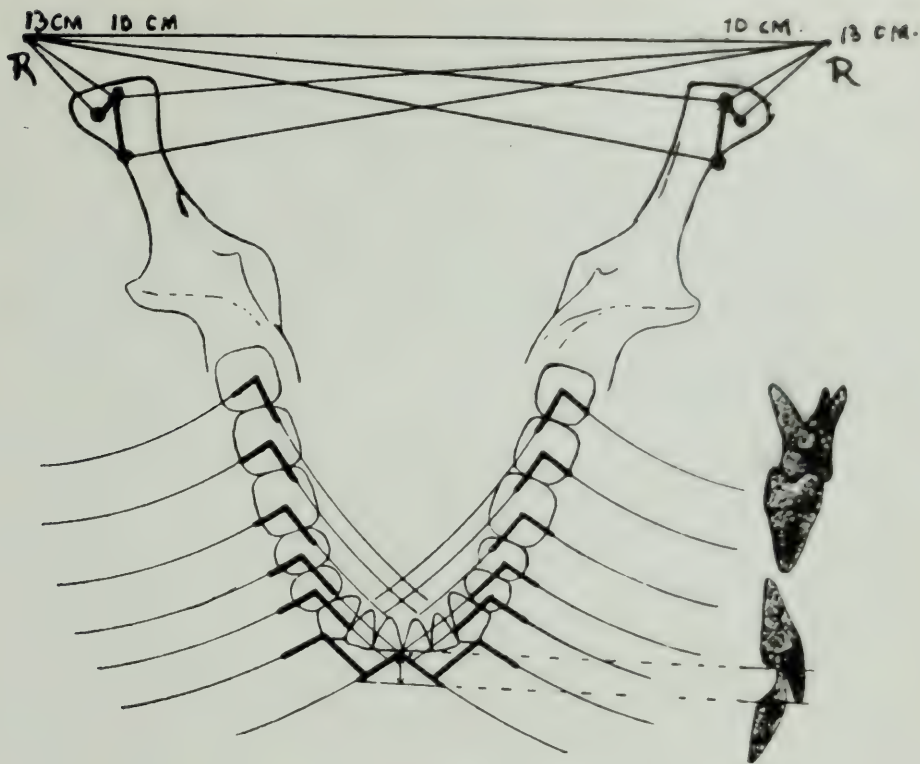


Fig. 39A.

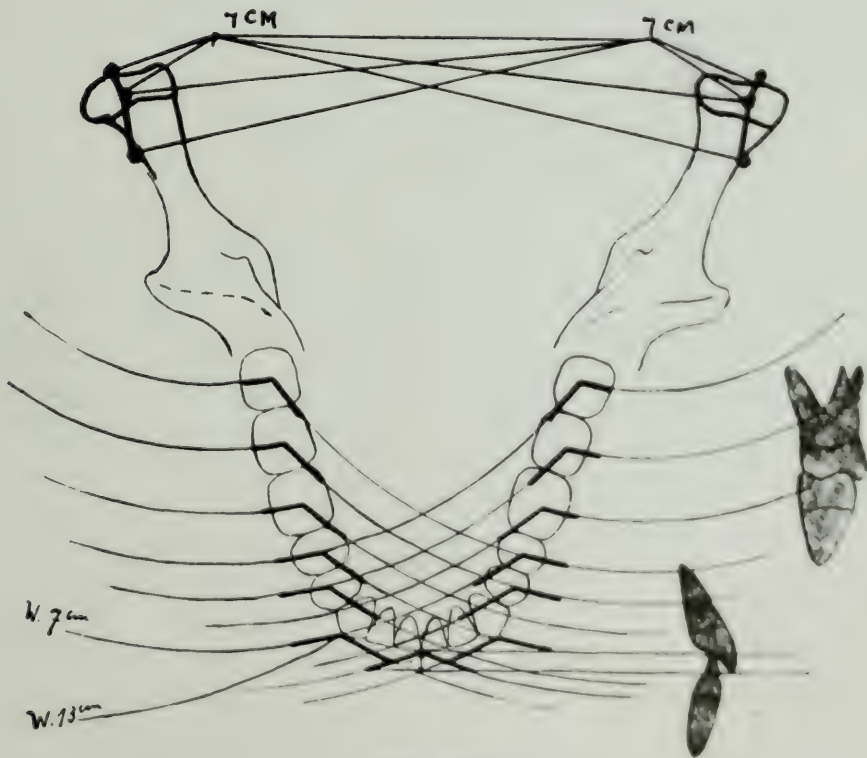


Fig. 39B.

CHOICE AND ARRANGEMENT OF TEETH.

The close proximity to the artificial teeth of partial dentures as well as crowns and bridgework of the natural and living teeth make the problem of color and form the most difficult of all. While the teeth offered to the profession to-day, resembling as they do the crystallized knowledge of some of the brightest minds in the profession, such as Drs. Williams, Gysi, and others, yet in partial denture construction, alterations in form and color are frequently necessary. The imitation of receded gums, with considerable length of root showing (Fig. 40) different stages of wear, overlapping, erosion, cracks in



Figure 40.—Grinding teeth to imitate recessed gum. (a) Tooth, correct width, but too long. (b) First cut, outlining mesial and lingual side of root. (c) Second cut, outlining mesial and lingual side of root. (d) Third cut, outlining mesial and distal side of tooth. (e) Fourth cut, outlining labial of tooth. (f) Cuts smoothed and rounded with disc and "gloss stick."

enamel, characteristic forms varying from ordinary, chalky spots and creases in enamel to brown stains from tobacco, etc., occurring in corresponding teeth on the opposite of the arch should be reproduced with greatest fidelity. A careful selection, with the articulator and models carrying the assembled frame work in the hand, with full details concerning the shade at hand are necessary, following that in some cases the use of the stone, discs, porcelain polishing materials, and porcelain stains. Dr. Wilson's text, *Dental Prosthetics*, P-501, gives details concerning this most important branch.

ARTICULATING.

The front six should be adjusted satisfactorily and tried in the patient's mouth before any of back eight are adjusted. Incidentally, at this stage might be mentioned one of the great advantages of the assembled and soldered gold base, as at the time the assembling of the various parts forming the base is complete, the retainers are adjusted and the piece fits positively into place as when completed, and the teeth firmly waxed thereupon an exact counterpart of the future denture is available for inspection and study; lacking in vulcanite and aluminum pieces, gold dummies and occlusal surfaces of crowns may be formed in wax either in the mouth (Fig. 41), or against one another, or against porcelain or plaster reproductions of natural teeth as the case may be, or porcelain teeth against Melott's or Spence's compound lower, the former showing the high spots black. Side and protrusive movements should be given as each tooth is added, and interference corrected with the stone if necessary. In case of too limited space for porcelain teeth, the tooth of the series desired may be mounted in the swager ring with Kerr's compound, a piece of pure gold of 34-gauge adapted directly to the porcelain tooth, filled with a

20k. solder on asbestos, and with the addition of a loop, a perfectly accurate replica of the occlusal surface of the tooth (save for the thickness of the gold .006") (Fig. 41A) may be rapidly secured. In event of insufficient space even for this; the writer has secured good results by securing side movements on wax, added directly to gold, saddle, carving, and casting directly to saddle.



Figure 41.—An engraver's "block." (Price \$7.00 and upwards, in jewellers' supply houses.) A universally movable revolving vise, in which engravers clamp various articles to be engraved. A bridge, crown or inlay, in which it is desired to deepen the sulci with a diamond-shaped engraving tool, placed in the swager ring with Kerr's compound, and clamped in above, may be worked upon with greatest facility with the engraving tool.



Figure 41A.—Special tooth for short bite. B, Ditto, mounted in swager ring with pure gold (34 gauge) swaged over it. C, Pure gold occlusal surface removed from tooth. D, On asbestos block, filled with solder and 18 gauge wire inserted. E, Wire bent down forming loop.

CONVERTING FROM WAX TO VULCANITE, CORRECTING, ETC.

All the known precautions should be observed, namely, the non-use of hasteners in plaster, use of Spence's plaster compound, Sorrel stone or Green curved metal reinforcement for teeth similar for casts, non-overstirring of plaster, use of springs, careful packing, gate cutting, etc., with proper scoring, as many as possible retainers, and a sharp finishing edge on metal base (Fig. 42). No shrinkage should be encountered.



Figure 42.—Cross section of metal cast saddle, showing abrupt finishing edge, spurs, etc. Tooth and vulcanite attachment shown in dotted lines.

The cases may thus be returned to the articulator, having been polished, and any necessary corrections made with a mixture of medium carborundum and glycerine (P-214, Clapp, Prosthetic Articulation), or carbon paper, or, if only one arch is restored, by the mere rubbing of the Melott's antagonizing model and a slight grinding of marked points.

Upon returning to mouth the only possible correction that should be necessary should be the final slight adjustment with carbon paper, giving the natural teeth a larger percentage of stress, and the possible final adjustment of the retainers, indirect retainers, etc.

Illustrative of the foregoing, the writer believes an example of a definite restoration, giving each step, will be of assistance.

Condition, upper: Four badly broken down molars, first and second. Upper first left abscess, long standing, level with gum, except distal wall, which standing in good condition. Anterior ten absent and absorption complete.

Restoration, upper: Gold crowns, above gingival margin, 14 gauge wire carried distal from each of second molar crowns 2mm. above gum. Roach attachment for first molar, distal horizontal wire for indirect retention. Denture-cast gold saddles, vulcanite attachment with Roach attachments and distal rests. (Fig. 43.) Lower

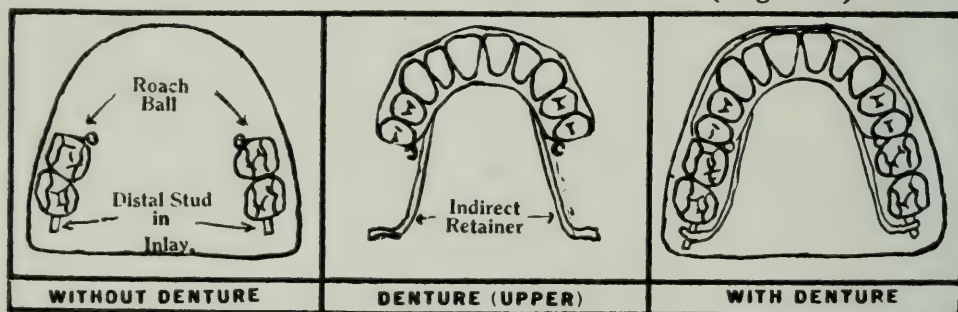


Figure 43.

condition so-called hygienic bridge in healthy condition on left from lower first bicuspid to lower second molar, anterior six and lower right first and second bicuspid, all in good condition, rest absent.

Lower Restoration: Bar lower, with stud engaged in hole made in bridge (in mouth), indirect retainer below first molar or bridge, with clasp and bar joined to gold saddle carrying teeth on right. (Fig. 44.)

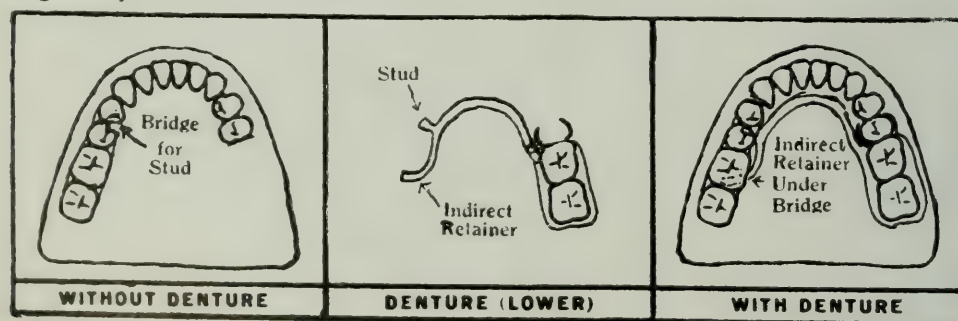


Figure 44.

Steps: Upper (begin first because of treatment). 1. Upper left first molar (first because of abscess), caries removed, canals thoroughly opened and washed, Howe screw post fitted diagonally using Hood's angular hand piece, with Howe screw post drill in engine, and S. S. White actuator (Fig. 45) working tap, and subse-

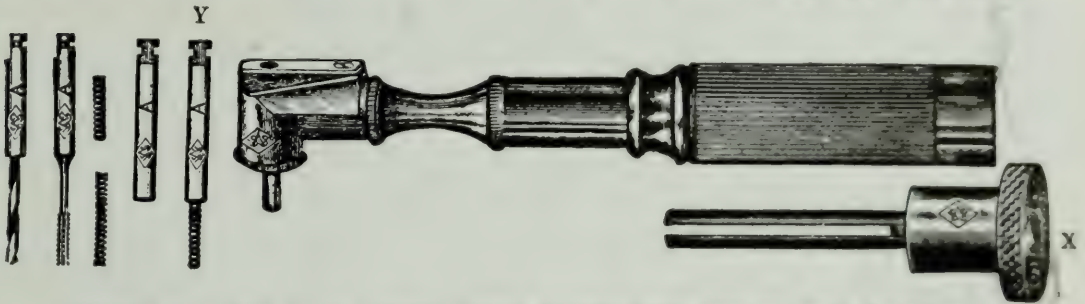


Figure 45.—The S. S. White Howe Screw Post System and Actuator. (a) Howe screw post drill for right angle handpiece. (b) Howe screw post top for right angle handpiece. (c) Lengths of screw post. (d) (e) Instrument for placing Howe screw post. (f) (g) Right angle hand piece and actuator. The actuator fits in the engine end of handpiece.

quently screw driver with Howe post into position, in cement, Gutta-percha cones in canals, silver nitrate to dried dentine. Onderdonk or Ivory matrix, pack amalgam; remove gutta-percha cones before amalgam sets, seal in formo-creoso. (See Fig. 10.)

2. Treat, fill and restore upper molars, prepare for crowns, treat with silver nitrate, make small compound impression of each pair, fill with Spence's plaster compound.

3. Fit bands to each of above (four upper molars), try in mouth.

4. Heat left pair of crowns, dip occlusal ends in two-ply softened sheet wax, trim and slip in mouth, asking patient to close gently (to separation desired) and make side movements. Remove, trim, carve cusps and casts. Over right pair solder floors of pure gold (no opposing teeth here yet).

5. Add yellow wax to inside of each of the bands of the crowns, press home, fill with Spence's plaster compound, reburnish. (See Fig. IX.)

6. Returning to model, fit or make special tray (if patient has an old type denture push compound in and fit stock tray or make pattern for cast aluminum tray on this. Take impression, Byrtis or Neilson plaster, having patient make whistle and smile movements, massage lips, add wax inside of crowns for easy removal, make Spence's plaster compound cast, with crowns mounted thereon.

Lower: 1. Drill hole in bridge, size of 14 gauge wire, fit plaster or compound cores below bridge. (Fig. 46.) Fit wire to hole.

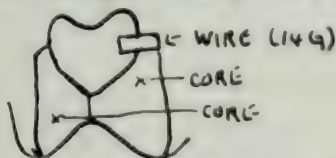


Figure 46.—Showing position of cores, wire, etc., for impression of lower

2. Make separate plaster impression of lower right second bicuspid, pour in Melott's metal, form clasp from tinfoil pattern, using contour and other pliers and small steel hammer for close adaptation, add clasp to bicuspid and short piece of 14-gauge wire in hole, make special tray from plaster model from rough compound impression, or fit stock tray to mouth, to tips of incisors only.

3. Heat compound and apply to tray, take impression in compound.

4. Remove impression and trim margin thin, cut out around pin and clasp, build up biting block, trim margins thin.

5. Soften lingual distal, half return to mouth, have patient close and swallow, repeat until no further action or muscle or compound, gently pressing material toward ridge with wiping finger movement.

6. Soften lingual mesial half, have patient lick lips, following with slight finger pressure against material toward ridge. Repeat till no further action.

7. Soften buccal rim, have patient close firmly and cheek massage. Defines masseter muscle, continue till no further action.

8. Replace cores, clasp and 14 gauge pin, flow thin plaster on impression, return to the mouth, have patient hold by closing. Work ball of softened compound across labial aspect, front sixes either now or with hardened plaster and compound impression subsequently in place. Remove and place clasp pins, cores, etc., in impression. Pinch thin copper around pin, pour in plaster giving cast with clasp, and copper lined hole. Add Roach and Distal rest wires to upper with wax, remove, invest and solder.

9. Cast gold saddles and assemble various parts by solder.

10. Build down upper to contact, build up lower to ditto, add Gysi registering instruments (special horseshoe plate without pin on left side), take lateral and condyle tracings. Attach lower to articulator; from this attach upper, first having removed horseshoe plate, etc.

11. Return both to mouth, cut away upper wax sufficient for thickness horseshoe plates, make rotation point tracing.

12. Grind or stain anterior six, if necessary, set, add bicuspids, upper and lower alternately, giving side movements. Add wax to upper right crowns articulating with lower porcelain, carve and cast.

13. Vulcanize, return to articulator, correct for interference of porcelain and gold, insert and adapt.

In conclusion, the writer wishes to repeat that one of the problems in dentistry to-day is the removable, sanitary, mechanically correct, efficient, unobtrusive, non-gingival, margin-irritating restoration of lost

teeth, the construction of which is well within the reach of the average and near-average practitioner and his efficient and faithful co-worker, the laboratory man, and most important of all, within the reach of the great mass of the semi-edentulous public, and that when dental science approaches this ideal that the partial denture to be will play no unimportant part as a means towards this happy end.

A Dentist's Hobby.

BY THE EDITOR.

MOTORING from Toronto to Grimsby during the latter part of May, a few acres of land a mile or so west of Grimsby, Ontario, in the very heart of the Garden of Canada, caused every member of the writer's party to peremptorily demand a dead stop. Exclamations of surprise and pleasure were uttered by every one, and the road was literally lined on either side with other cars containing motorists, who were loath to pass a spot of such surpassing beauty without a prolonged look.

Tulips to right. Tulips to left. Tulips everywhere. 60,000 plants, most of them in wonderful bloom, and of most rare and costly variety. There were upwards of 200 varieties, among them being about 125 Darwin species, 60 late cottage garden tulips, numerous wild botanical types from Central Asia, also a number of rare specimens of the Parrot family.

Interest is certainly added to this wonderful collection of tulips



VIEW OF TULIP DISPLAY AT SUMMER HOME OF DR. DONALD CLARK AT GRIMSBY, ONTARIO.

when it is known that it is all the result of the "pet-hobby" of a practising dentist, Dr. Donald Clark. Dr. Clark's office is in the city of Hamilton, and he goes back and forth each day, a distance of 16 miles from office to garden-home, and confidently makes the assertion that his hobby has not only given abundant pleasure to himself and others, but has been the precursor of good health and a "life-saver" to him.

Dr. Clark has been in practice in the city of Hamilton for many years, and represents District No. 4 upon the Board of Directors of the Royal College of Dental Surgeons of Ontario.

The following extract, taken from a letter received from Dr. Clark, shows the motives that have dominated this most successful horticulturist:

"I started out with the idea of having flowers grown out-of-doors from the time the snow disappears until it comes again, and I think that I have succeeded fairly well; in fact, I have a liking for decorating my Christmas dinner table with flowers picked out of doors on Christmas morning, usually from under the snow. Remember, they are real flowers of the most delicate possible structure. To get bloom the season through you must grow bulbs and perennials as well as annuals. This all requires a large amount of study as to the habits of growth as well as season of blooms of the different species. Their name is legion, especially when it comes to varieties. Another very interesting thing is planning to prolong the season of any particular type by procuring very early, early, mid-season and late varieties. This is particularly easy with such flowers as narcissus, tulip, peony and iris, and as for roses you should have them from June till hard frost. Another thing that has to be studied very carefully is their diseases and insect enemies, with a cure for each. You must also be prepared for many disappointments.

"To come back to tulips, I may say I started in a very modest way in the autumn of 1909 with about 275 or 300 bulbs, or five each of about 55 or 60 varieties. You have seen what I now have—60,000 bulbs and over 200 varieties. These are all late varieties, comprising Darwins and Cottage Gardens, also Biggars, Parrots and Rembrandts, and several Botanical or wild species from Central Asia, which are most interesting. The color embraces everything imaginable between black and white. In height, from miniature Botanical specimens to Darwins, 35 inches high. I am doing this work because I love it, and because I know of nothing better for any man, both physically and morally."

This floral display can be compared to nothing but squares of most beautiful carpet—each square of surpassing beauty and each marvellously blending with its neighbor. In addition to the beauty of bloom, the length of stem was exceptional, in many cases measuring as much as 35 inches.

Dr. Clark, by patient toil and study, has become an authority on tulip bulbs, and now possesses one of the finest and most comprehensive collections to be seen anywhere in Canada between Halifax and Vancouver.

A short time ago Dr. Clark succeeded in obtaining an additional 5,000 bulbs from Holland, and these have been added to the collection. With ordinary good luck this mammoth display should develop a magnificent bloom next year, and its inspection and study next spring will, no doubt, be quite worth while a trip of many miles.



Talk about a hobby for a dentist. Could a more healthful or more joyous hobby be imagined? Hearty congratulations, Donald. You have been really "living" in these past seven years, and have, at the same time, been giving unspeakable pleasure to the thousands of flower lovers who have had the good fortune to pass along the road from Grimsby to Burlington.

The following extract from the *Toronto Telegram* is of interest:

"That Ontario can produce just as fine tulips and just as many varieties as ever Holland could, was surely proven last night by the gorgeous display of the Toronto Horticultural Society in the Odd-fellows' Hall on College Street.

"The exhibits were arranged on small tables in the large auditorium, thus allowing the visitors to get about easily and see each exhibit plainly. Of particular note were the tulip displays of Sir Edmund Osler and Dr. Donald Clark, of Grimsby. Dr. Clark exhibited no less than sixty-five vases, comprising as many varieties of the flower. He was awarded a special medal and a certificate to the effect that his was the largest and finest display of tulip blooms ever shown in the city. Among them were some of the latest devel-

opments in tulip culture from Holland, but which did not in any way surpass those produced on his own farm. Some of the striking varieties were: Retroflexa, resembling a yellow lily; Nora Ware, lilac in hue; Elegans Alba, white with narrow red edging; Night and Sultan, almost black; and tulips of fawn, coffee, red green and brown variegated shades."

Direct and Indirect Method of Casting Base for Crowns on Third Molars or Difficult Teeth.*

BENJAMIN L. BROOKS, D.D.S., LYNCHBURG, VA.

WITH the advent of the casting machine and oral hygiene and prophylaxis, a new dawn broke upon our methods of operative procedures. The absolute necessity of perfectly constructed and non-irritating dental work has been emphasized in the preservation of sanitation and health in the mouth. A complete change of methods has been brought about. Our idea now is to put aside all methods that irritate or interfere with the work of nature in her efforts to maintain perfect health. This is particularly true in artificial substitutes for lost tissue, and especially so in crown and bridge work. The old style banded and gold cap crowns have no place in modern dentistry. They invariably produce a pathological condition of the vital tissues through their impingement upon the gum tissues. A perfect fit around the tooth is almost impossible of attainment. It makes no difference how careful one might be in his technique. The banded crown simply means a lodgment of irritating substances. Overhanging margins such as these ill-fitting crowns produce with their encroachments, and the cement forced down upon the soft vascular tissue-forming pockets for the collection of food and bacteria, are about the worst things imaginable in the mouth. Such methods are directly opposed to the principles of good surgery. We dentists do not tolerate such unscientific methods in any other form of work. If our fillings and other restorations were left in such condition we would be branded as a quack and counted as being careless and inefficient.

It is possible to entirely eliminate these disagreeable features in crown and bridge work by adopting the technique and method herein described. Crowns and abutment crowns for bridges on molar teeth, even the difficult third molars, can be made of porcelain with gold base, perfectly fitting, with almost the same ease and skill as it requires to make other forms of crowns, which are far from ideal.

Porcelain is the very best substitute known for the natural tooth in mastication, and for this feature alone ought to be used wherever

*Clinic given before the annual convention of the Virginia State Dental Society, Richmond, Va.

possible. Porcelain lends a charm of refinement to the acme of workmanship and skill. It appeals to those who are fastidious and want the very best—it looks like the best. It is easily manipulated by following this technique and method:

TECHNIQUE—DIRECT METHOD.

The roots are prepared in the usual manner under aseptic conditions, filled and sealed to within a quarter of an inch of the chamber. This ought to be done with practically the entire top of the tooth removed. The crown is now cut off flush—with sharp fissure burs, coarse stones and extra large rosehead burs (sometimes called vulcanite burs)—cut down to just under the free margin of the gum—mesio-distally, in long teeth just above—bucco-lingually, depending entirely upon the case. Operator must use his judgment as to prophylaxis and to the extent of cutting to simplify the construction and secure a space of sufficient thickness for the porcelain tooth. The chamber is now prepared by making it as near box-shape as conditions will permit. This will give, in some places, sufficient retention for a crown with a perfect fitting base. If more retention is required pins can be used. The nerve chamber is boxed in the same manner, but enlarged to extend well over the canals to be used so as to allow the wax impression to grip the pins thoroughly. The canals are now reamed to a depth of one-quarter of an inch or more, care being taken to ream them in such a way as to leave them parallel. If this is not possible on account of extremely diverging roots, the pins can be cut off on one side and placed in their position in the canals in such a manner that in withdrawing them while attached to the wax base, their outer planes will be parallel and slip by the undercuts with ease. The pins are allowed to extend high enough above the canals in the boxed chamber to engage the wax firmly in taking the impression. Before finally putting the pins to place and taking impression, the prepared tooth should be oiled slightly by using a very small amount of white vaseline, and excess wiped off with a pellet of cotton. A piece of Kerr's inlay impression wax, large enough to fill the chamber and cover the surface well, leaving a small bit to be gripped with the fingers for easy handling, heated and shoved to place. If preferred, a copper band, slightly larger than the tooth, may be used for impression cup, filled with wax and shoved to place, thoroughly chilled and removed. The copper band is split and removed, and the wax impression trimmed to the proper circumference of the tooth. The impression ends with pins invested with inlay investment. For the Elgin machine I prefer Standard Compound, two-thirds, and S. S. White's "Fryite" one-third, for this purpose. This is allowed to harden and trimmed to the margins of the wax. A sprue is attached at one side and allowed to rest close on the investment, so that the wax base can be carved as thin as possible or necessary.

This is the pretty point. The wax base can be trimmed as thin as paper, with ease, without distorting or interfering with the fit in the least. The whole piece is now invested as an ordinary inlay would be and cast, fitted back on the tooth, and impression and bite taken with plaster or compound, models run on anatomical articulator, and a Goslee, Steele or plain platinum pin vulcanite tooth, with heads of pins cut off (backed in the ordinary way), adjusted to occlusion, waxed, invested and soldered.

TECHNIQUE—INDIRECT METHOD.

The tooth is prepared in the same manner as described for the direct method. Pins cut and placed in the same manner. Copper band of sufficient size to fit well over the tooth and trimmed so as to allow the teeth to come together, when the band is in place over the tooth. The prepared tooth is oiled as described in the direct method. The copper band is now filled with soft impression compound or plaster and shoved to place, with pins in position and allowed to harden. It is now removed to make sure that it will come away perfect and to see that you have a sharp impression. It is then replaced on the tooth and an impression and bite taken of both jaws. Models are now run, using hard model plaster for the opposing jaw and inlay plaster for the crown model and mounted on the articulator. The impression is now removed, the pins will be in their proper positions, with a sharp reproduction of the prepared root ends. The pins are cut off if too long above and inlay wax run over them well on to the margins; crown backed and fitted as in the direct method. The crown is now cut off and mounted, invested and cast. The only advantage of this method is its quickness. It is not as accurate as the direct method, and I do not recommend it as being as perfect or satisfactory as the direct method.

Proceeding Overseas with the C.A.D.C., Second Draft

[The following report of the journey of the C.A.D.C. Second Draft, Overseas, has been received by ORAL HEALTH, by courtesy of Capt. E. A. Grant. The material was published in a most attractive brochure, which reflects great credit upon those who had the "history" in charge. —EDITOR.]

AFTER several delays and when hope of ever getting across was almost lost, the second draft of the Canadian Army Dental Corps to proceed overseas, finally commenced to move. The detachment of 20 officers, 19 sergeants and 20 men, drawn from practically every division in Canada, was in charge of Major A. A. Smith, who left Ottawa on December 15th, 1915, after turning over

the duties of Acting Chief Dental Surgeon to Capt. W. B. Clayton.

On arrival in Montreal he was met by some of the party and then proceeded to St. John. To some of us the twenty-six hours' run on the Intercolonial was rather tiresome, but it must have been doubly so to those from the far west, especially Capt. Tait, of Victoria, B.C., who had to spend seven days on the train.

At St. John the party was met by a committee of local dentists, headed by Capt. Magee, who escorted us to the Royal Hotel and did everything possible to make the stay in St. John enjoyable.

Friday was a busy day. An orderly room was secured and the work of organization proceeded rapidly. Capt. Walt was appointed adjutant until the detachment reached Folkestone, and Capt. Winnett was the first orderly officer. Each officer was detailed to some duty.

In the evening the officers were tendered a dinner by the St. John Dental Society. After the toast to the King, the chairman, Capt. Magee, proposed a toast to the C.A.D.C., which was responded to by Major Smith and others. An interesting feature was the story by Lieut. Wilson, a wounded officer returning to England, of his experiences in the trenches and how he was "moved" out of them by a high explosive shell.

After Capt. Walt had expressed the thanks and appreciation of the C.A.D.C. officers for the very enjoyable evening, and the courtesies and hospitalities extended by the St. John dentists, the meeting broke up with "God Save the King" and "Auld Lang Syne."

There is more than a suspicion that their hospitality did not end there, but was continued further into the night, but of this, history sayeth not.

However, we will all have very pleasant recollections of our stay in St. John.

The corps were astir early on the morning of December 18th, and by 7.15 a.m. were ready to move off from the Royal Hotel. They presented a businesslike and trim appearance as they marched through the fog and the rain to the ferry and thence to the C.P.R. dock. After a short delay, they were marched on board the s.s. Missanabie, and the rest of the morning was spent in getting settled in the various quarters.

The troops on board, totalling 1,721 and comprising 23 different units, were mostly small reinforcement drafts; Major Cape of the 3rd Siege Battery being O.C. There was also a party of Jack Tars on board, returning from gunnery practice in Bermuda. About 8.30 in the evening, to the accompaniment of cheers and singing from the men on deck, Captain Winnett, assisted by the Chief Engineer, pulled the lever which started the boat on its journey to Old England.

Fortunately, Sunday, our first day at sea was fine and warm. Divine service was held in the morning and a concert in the evening.

Everyone was agreeably surprised by the fine, warm weather of the next few days, and the poor sailors were beginning to think that an ocean voyage was perhaps, after all, something of a picnic.

On Monday a dental clinic was opened for the benefit of the troops on board and placed under the supervision of Captain E. D. Madden, with two officers detailed each day for duty. Emergency work only was undertaken and some urgent cases were relieved. But the fact that the clinic was not kept over busy, seemed to prove that the dental needs of each draft had been pretty thoroughly attended to by the C.A.D.C. in the Canadian concentration camps before leaving.

After the first few days everyone naturally fell into the daily routine of life on a troopship. Everything was run in a military manner. Each unit issued daily orders and every morning the O.C. and ship's captain, accompanied by the orderly officers of the day, made their round of inspection. Hours were arranged for each unit for physical drill and a daily practice of lifebelt drill was carried out. This was at times very amusing and exciting, especially as the ship approached the danger zone and there was a possibility of a real danger signal. At the signal of two blasts on the ship's siren, followed by the bugles sounding the alarm, each man proceeded to his cabin, tied on his lifebelt and then went by the shortest route to a position assigned on the deck and fell into line to await further orders. Each man had also been given the number of the lifeboat he was to enter, if such a contingency should become necessary. After the first practice, this drill was carried out with such celerity that only three minutes after the first alarm, each man would be in his allotted position.

A concert by the Jack Tars on board on the night of Tuesday, 21st, was an event of unique interest to the soldiers. It reminded one very much of a school closing concert of our younger days, as the singer would often break down in the middle of a song, either because he had forgotten the words or the tune was pitched too high, and then, not a bit disconcerted, he would start all over again. However, this only served to add to the enjoyment of the evening, and one felt that Major Cape, the chairman, in expressing the thanks of the Canadian soldiers to Lieut. Skinard and his men, very aptly expressed the sentiments of all when he said we could not forget that it was because of the efforts of our brothers the sailors of the British Navy, that we were able to travel across in such comfort and security.

On the morning of Wednesday, 22nd, we ran into cold, rainy and stormy weather, which lasted for three days and kept the poor sailors between decks. The writer must admit that he was one of those who spent most of the time in their bunks, and therefore knows very little of what was going on. However, he believes that those who were able to be about were not enjoying themselves very much.

On Christmas Eve we were warned that the ship would enter the

danger zone the following morning and that each man should carry his lifebelt at all times.

Christmas morning opened fine and warm, and everyone was astir early and up on deck to enjoy what was perhaps the most unique Christmas they had ever spent. The fact that they were in mid-ocean and the danger zone did not seem to dampen the Christmas spirit as the old, old greeting was exchanged. Many dived into their trunks and produced odd shaped parcels labeled "Not to be opened until Christmas Day." The gifts contained took one's thoughts back home where the spirit of Christmas always centres.

A programme of sports was run off throughout the day on the afterdeck. The wrestling and boxing bouts were the principal features. Sergt. Howe, of the C.A.D.C., proved himself to be the champion boxer of the ship.

About 4.30 in the afternoon, everyone was rather startled to hear the siren signal, as it was thought that practice drills were over. Instantly there was a scamper and in a very short time all were lined up on deck in review order (with lifebelts) and peering into the sea, wondering what was coming next. After standing there about ten minutes, we were dismissed, not at all sorry that it was only a false alarm.

Excellent Christmas dinners were served to all ranks and in the evening a splendid concert was given in three cabins in order to accommodate all the audience. The committee in charge were embarrassed by the quantity of clever talent on board and had more than enough artists to keep all three concerts going till midnight. The biggest hit of the evening was Lieut. Black, of the 35th Battery, and his minstrel troupe, who put on a very amusing hour's entertainment.

The most interesting event of the next day (Sunday) was the first appearance of our convoy, which came alongside about 10 a.m. and accompanied us till noon. However, it was wonderful how great a feeling of relief and confidence was inspired by this little patrol boat, which seemed to typify the Navy's watchful care over us. One could better enjoy the Christmas hymns which were sung at Divine service.

The afternoon was spent quietly with packing preparations, as the boat was expected to dock before morning, and orders were issued for reveille at 5.15 and early breakfast.

However, we were rudely disappointed the next morning to find that, instead of being tied to the pier, the ship was "hove to" in the English Channel. During the night a gale had sprung up which prevented the captain from making the narrow entrance to Plymouth harbor. Here we had to put up with the worst tossing of the whole trip, as the Channel certainly lived up to its reputation. Each had

his own story to tell of what happened when one big wave struck the ship broadside with a thunderous roar and swept right over it.

About 3.30 in the afternoon, although the gale had not abated, was, in fact, even worse, the captain decided to go in. At any rate, it was a very anxious time for all on board, as even a landsman could see that it was a very risky undertaking to take a big ship through a narrow channel between the rocks with a tremendous gale blowing across it. The crowds on the deck heaved a sigh of relief when after an hour of hard work and good seamanship, the breakwater was passed and the ship dropped anchor for the night.

The next morning, Tuesday, the 28th, tenders came alongside, and after a short sail up the pretty harbor of Plymouth, we landed about noon. By 2 p.m. all were aboard a special troop train for Folkestone. It was for some their first sight of an English train, with its odd compartment carriages. The insignificant little engine, with its ridiculous toot-toot, caused a great deal of amusement at first. For the first few hours, everyone was busy looking at the beautiful scenery of Cornwall and Devon and the crowds of people who came from all directions to wave a welcome to the Canadian boys. When this was all shut out by the early darkness the boys naturally thought of something to eat, and at every station there was a hurried raid on the lunch baskets and bun wagons, which never had enough to supply the demand, and as the train pulled out of the station the boys would give vent to their feelings by sticking their heads out of the windows all down the long train and yelling in chorus, "Are we hungry? Well, I guess YES."

On arrival at Folkestone, about midnight, the party was met by Colonel Armstrong and Capt. Holmes. The N.C.O.'s and men were taken to their quarters on Earles Ave., and the officers were billeted at Wampach's Hotel.

After a few days' leave, no time was lost in getting down to work, and the officers were detailed for duty at the various camps, as follows:

Major Smith, C.A.D.C. Headquarters, Folkestone
 Capt. A. W. Winnett, Shorncliffe Military Hosp'l
 Capt. C. V. W. Marshall, Shorncliffe Military Hos.
 Capt. J. W. Bell, Westcliffe Eye and Ear Hospital
 Capt. J. E. Wright, Moore's Barracks Hospital
 Capt. C. S. Walt, West Sandling Camp
 Capt. E. J. Kelly, East Sandling Camp
 Capt. G. H. Bray, Beachborough Hospital
 Capt. J. F. Morrison, Clivedon Hospital
 Capt. E. S. Tait, Epsom Convalescent Hospital

Capt. E. D. Madden, St. Martin's Plain
 Capt. J. F. Shute, St. Martin's Plain
 Capt. W. A. Burns, St. Martin's Plain Laboratory
 Capt. E. A. Grant, Bramshott Camp
 Capt. W. A. Sangster, Bramshott Camp
 Capt. L. L. Matchett, Bramshott Camp
 Capt. E. McNeill, Bramshott Camp
 Capt. H. C. Macdonald, Bramshott Camp
 Capt. R. C. H. Staples, Bramshott Camp
 Capt. P. B. McNally, Bramshott Camp

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

PERFECT AMALGAM FILLINGS.

RENEWED interest in the old problem of amalgam fillings has been aroused by the excellent results obtained by Dr. William E. Harper, of Chicago. A detailed account of his methods is published in the April issue of *Dental Cosmos*.

Dr. Harper does not place dependence upon the amalgam micrometer as a means of testing the efficiency of amalgams, because, in his opinion, such methods do not show the sufficiency of adaptation of the filling material to the cavity walls—the most important feature, perhaps, in any filling material. In place of the micrometer, an air-pressure apparatus has been devised by means of which a leaky filling, due either to the quality of the alloy or the imperfectness of technique in preparing same, may be easily demonstrated.

Contrary to most heretofore published opinions, Dr. Harper favors a plastic mix rather than a dry one. He finds that such a mix, “thoroughly packed into a cavity will set as quickly and as hard as a dry mix, and will improve the adaptation.” The requisites for perfect amalgam work are, “a thorough mix, extra plasticity in all cavities requiring much time to fill, and forcible packing with orderly stepping of the plugger to insure thorough and uniform condensation.” It is pointed out that where perfect adaptation has been obtained between the filling material and the cavity walls, no discoloration of the tooth substance about the filling will take place. This statement is of prime importance, in that it removes one of the outstanding objections to the use of amalgams.

The use of proper proportions of alloy and mercury aids materially in bringing about satisfactory results; to this end Dr. Harper suggests the weighing up of a supply of capsules containing known quantities of alloy and mercury. The amount of each may best be determined by following the instructions given by the manufacturer, and then modifying the amounts used as experience dictates.

Owing to the short time during which the “condition of plasticity

favorable to adaptation exists, it is best to complete the cavity preparation, adjust the matrix and select the instruments to be used in the operation, before mixing the amalgam. Kneading of the amalgam mass from time to time during the process of insertion tends to prolong the condition of plasticity. It is extremely important to prolong the plastic stage, because an amalgam mass, if set upon the operating table, will cool, which greatly hastens the setting."

The mixing of alloy and mercury is done with mortar and pestle and kept up for a period of from two to three minutes. Owing to the fact that all high grade alloys are difficult to amalgamate, it is imperative that sufficient time be given the mixing process to insure complete amalgamation. Dr. Harper suggests the use of an ordinary egg-timer for the purpose of measuring the time taken in this procedure.

After the mass has been well mixed, it is turned out and kneaded for from one-half to one minute. Where large cavities are to be filled, it is suggested that the excess mercury be not removed when kneading, "but allowed to remain in the mass, to be removed only as expressed to the surface during the packing. This will insure that additional extra plasticity of the mass which will permit the filling of the first half of the cavity without the development of crepitus or evidence of setting."

A detailed account of instruments used, etc., is given by the author, and the reader is referred to the original article for particulars of same.

EMETINE VS. SUCCINIMID OF MERCURY.

With a view to establishing the relative merits of Emetine and Succinimid of Mercury in the treatment of pyorrhea alveolaris, a series of experiments were conducted by Ralph P. Lowell, D.D.S., and Stephen A. Cobb, M.D., both of Sanford, Me. The results of their efforts in this direction are published in May issue of *Dental Cosmos*.

The methods of administration of these drugs were those generally advised for use by dentists, so that the results have peculiar interest for us. Some of their findings are rather unique; for instance, "We feel that pyorrhea alveolaris is due wholly to the neglect of the mouth and the alimentary tract, and that the endamoeba buccalis that is found normally in the mouth really exaggerates this condition by its presence." These investigators find that there is little to choose between the merits of the two drugs. Good results were obtained, and it is thought that with good care, combined with intelligent co-operative efforts on the part of the patient, permanent cures might be effected.

IONIC MEDICATION.

One of the most promising fields for the use of this method of

treatment is in the curing of oral diseases. Strange to say, its use in this connection has been very limited. The plea for a greater consideration of the merits of ionic medication in the treatment of such ailments as pyorrhea alveolaris, etc., as made by Dr. Ernest Sturridge, of London, Eng., in *Dental Cosmos* (April) is one that ought not to go unheeded.

Ionic medication is described as "a method of treatment in which electrical currents are used to conduct or convey, in a definite direction, ions of solutions which are dissociable by the electrolytic action of the current. The body contains combinations of chemical substances which are soluble in water, and which are good conductors of electricity; it is therefore an electrolyte which, when current is passed, responds to the electrical laws of decomposition of solutions and movements of ions towards definite poles."

Experiments performed upon gum, periodontal tissue and alveolus go to show that "ions penetrate a considerable depth into these tissues with a very low current strength." Where it is necessary, as so often happens in the treatment of dental affections, to clear up diseased conditions of the deep tissues about the roots of the teeth, it is manifestly impossible to effect this by the application of antiseptics to the superficial tissues. Ionic medication is said to be particularly suitable for the treatment of periodontal membrane, owing to the depth to which the remedial agents are carried.

When treating pyorrhea alveolaris by this method, an electrode is introduced into the pyorrhea pocket "conveying a solution of some salt, which is readily dissociated by the electrolytic action of the current; 3 per cent. solution of zinc chloride—from which zinc ions are formed—is one of the most effective salts, and a current of 3 to 15 m.a. provides a dosage of antiseptic ions sufficient to sterilize the parts. By means of such treatment it is possible to check the discharge of pus in a very short time."

In addition to its usefulness in sterilizing the parts, it is claimed that this method of ionic medication will, in some cases, bring about the formation of new bone about the roots of much-loosened teeth.

Dr. Sturridge would have dentists consider carefully this method of treatment with a view to avoiding the extraction of teeth of young people because of there being indications of or even looseness from pyorrhea.

STERILIZING THE TOOTH BRUSH.

This is a subject of prime interest, yet is not given the amount of attention that its importance warrants. Hugh W. MacMillan, D.D.S., in *Dental Summary* (February), suggests a method for efficient sterilization which is at once easy and unique.

His method is to sprinkle salt upon the brush after use. The salt becomes dissolved on the wet brush and penetrates thoroughly to the centres of the tufts of bristles. The brush is then set aside, and as

the moisture evaporates the salt crystallizes in and about every bristle. When required for use, the salt is knocked off or dissolved away and the dentifrice applied as ordinarily. This method is certainly simple. Is it effective?

DENTAL PHYSICS.

Some time ago it was suggested in the columns of this journal that a course of instruction be given to dental students in those departments of physics in which dentists are particularly interested. Such a course is now in process of preparation and will be given to students of the Royal College of Dental Surgeons, beginning with next fall term, and will no doubt prove of great value.

The introduction of the X-Ray as an aid in dental diagnostic work, as well as the increasing importance and usefulness of ionic medication in the treatment of oral diseases, demand that the dentist acquire requisite knowledge to equip his office with and know how to get best results from modern dental apparatus. The use of the X-Ray in dentistry has been the subject of much criticism, sometimes of the unfavorable variety. It has, however, demonstrated its worth, secured due recognition, and is now permanently established in the good graces of the profession. In the last analysis, criticism, provided it be honest and unmixed with prejudice, adds to, rather than detracts from, the merits of the object of its attacks. So it has been with the X-Ray; its most severe critics have been in reality its staunchest friends. As an illustration: In the April issue of *Dental Cosmos*, George M. MacKee, M.D. (New York), than whom dentistry has no better friend, in a brief, pointed article entitled "Radio Dermatitis Following X-Ray Examinations of the Teeth," while recognizing the X-Ray as an important modern dental apparatus, cautions against the use of same by those who have not sufficient training. Oftentimes we hear, even from professional men, that with a few pointers given by the X-Ray salesman, anybody can operate the apparatus without danger to self or subject. In other words, the opinion is abroad that science has succeeded in producing a fool-proof machine. Dr. MacKee is not in agreement with this view. He is of the opinion that dentists should realize that in the X-Ray "we have a very powerful and dangerous as well as useful agent, and in order to avoid injury to himself and patient he must be acquainted with the *physics* and biologic effects of the X-Ray."

Not infrequently, when urging caution in the use of the X-Ray, one is asked to state reasons for same. This is what Dr. MacKee has to say about it. "In the last sixteen months I have seen no fewer than eight cases of radio dermatitis produced by X-Ray examinations of the teeth. In all cases I am convinced that the fault lay in the technique. Fortunately, not in a single instance was there more than an erythema and edema, which lasted for from three weeks

to four months. In three cases the eyelashes, eyebrows and a portion of the scalp hair fell out, but the hair returned in all but one case. This was a little girl where the hair failed to return in the outer half of the left eyebrow. An X-Ray erythema is usually considered of no moment; but this is a mistake. I have seen a slight erythema of the face, an erythema that lasted a week or two, followed, a year or two later, by teleangiectasia (dilated vessels) or visible atrophy, or both."

In support of his contention that the dentist should be taught physics, Dr. MacKee gives a list of questions such as would likely be asked the dentist were he (unfortunate enough) to be a defendant in a suit for damages and were being examined for the purpose of establishing his efficiency as an operator of the X-Ray. These are a few selected from the list:

"What is the significance of the parallel spark gap?"

"What are meant by 'hard,' 'medium' and 'soft' rays?"

"Explain the purpose of the aluminum filter."

"Why do you employ the diaphragm?"

"What degree of quality has the most effect on the skin?"

"How can quality be controlled?"

"How can quantity be estimated?"

"What quantity of a given quality will injure the skin?"

"Why and how is the interrupterless transformer superior to the coil?"

These are the sort of questions that would be asked of the dentist, and his failure to give satisfactory answers would work great harm to the interests of his case. A complete course in dental physics ought, surely, to cover just such points as are raised by the above questions.

THE NEW DENTAL LAW OF NEW YORK.

The amended dental law of the State of New York comes into effect on September 1st, 1916, and introduces some features which are so radical in character as to be of interest to all dentists, and especially those who follow the efforts being put forth in Canada to improve the status and safeguard the interests of the profession.

Among other things, this Act provides for the cancelling of the license of "any practitioner of dentistry charged under oath before the board and found guilty of unprofessional or ignorant conduct, or with gross ignorance or inefficiency in his profession, or with fraud or deceit in procuring admission to practice."

Commenting editorially on this provision of the new law, *Cosmos* (May) says: "It will not be difficult to show in a given case that the operator who permits septic conditions to exist in connection with his root-canal work or his restorative operations in general, will be guilty of 'gross ignorance and inefficiency in his profession, and subject, therefore, to revocation of his license under the New York State

law—if, indeed, as the result of educated public opinion, he will not also be answerable for criminal malpractice.’ ” This looks like strong medicine, but perhaps the profession is suffering from ailments of a kind that require severe methods of treatment.

The inauguration of such legislation brings dental teachers of Canada face to face with a serious problem. Do our students receive sufficient training in root-canal filling to enable them to face fearlessly the enactments of a law such as the New York State law? If not, then our schools are responsible! Of the total college term only a few months are spent by the student in the infirmary, and only a portion of this time is spent in the treatment of root-canals. Consequently the student has little opportunity for observing the results of his methods of treatment.

In addition to establishing the liability of the dentist for unprofessional practice, the law deals with the legalizing of the “dental hygienist” or dental nurse. The time seems opportune for a more general discussion of this question. Its serious import demands attention.

TREATMENT OF ULCERO-MEMBRANOUS STOMATITIS.

A paper on the above subject appears in the April issue of the *British Journal of Dental Science*, and contains much information calculated to facilitate the treatment of inflammatory mouth conditions. This article holds particular interest for us, in that it is written by F. B. Bowman, M.B. (Toronto), Pathologist, Moore Barracks, Canadian Military Hospital, Shorncliffe.

Dr. Bowman, on examination of soldiers returned from the front, found, in addition to pyorrhea alveolaris, a peculiar condition “upon the gums (particularly around the last molars), the tongue, mucous surfaces of the cheeks, and the tonsils (which are most frequently affected), ulcers. These ulcers tend to spread laterally, save in the tonsils, where they burrow deeply into the tissues. They are covered by a white, friable membrane, easily removed, and then leaving a bleeding surface beneath.”

“The condition of the mouth in advanced cases strongly suggests scurvy. The gums bleed easily, are injected, retracted from the teeth, and spongy-looking. The teeth are apt to become loose, and are often tender when tapped with a metallic instrument. The breath is fetid and patients complain of a foul taste. There is always more or less glandular enlargement, the submaxillary and sublingual glands being most often affected.”

Dr. Bowman gives due recognition to such agent as emetine, etc., in the treatment of such conditions, but found that most satisfactory results were obtained by administering a combination of ipecacuanha or its alkaloid and Fowler’s solution. The following treatment gave “remarkably rapid and favorable results”:

R Vinum ipecacuanhae ℥ ss
 Glycerinum ℥ i
 Liquor arsenicalis ad— ℥ i

M.: fiat mish. Sig: To be used as a mouth wash; do not swallow.

Label "Poison."

"When the gums only are affected this solution can be carefully applied to the gum pockets around the teeth. Where there is ulceration elsewhere in the mouth or throat, the ulcer should be thoroughly wiped out twice every day with the above solution. All patients, whether or not the gums be infected, are instructed to drop ten to fifteen drops of the mixture on to a tooth brush twice a day and brush the teeth and gums vigorously."

With this treatment the condition clears up quickly: the ulcers heal, the fetid breath disappears, and the patient is soon able to eat in comfort.

Demonstrating Blow Torch Method of Cast and Solder Work.*

DR. WILLIAM PAGE WILLIAMS, BROOKNEAL, VA.

IN this clinic a compact portable outfit was shown, which appeals especially to the village and country dentist.

Dr. Williams used a Turner double-jet blow-torch for all of his casting and soldering, and in his own practice this kind of work is all done on the leaf of a roller-top desk just back of his chair, several asbestos mats being kept in a drawer beneath for this purpose.

The blow-torch, to which is attached a pressure indicator, is filled about three-fourths full of gasolene and pumped to about twenty pounds pressure, and while it may be turned low and kept blowing for a number of hours for waxing, light soldering, etc., without any great decrease of pressure, with a slight turn it may be brought to an intense flame for heavy soldering and casting. Gold is very quickly brought to the boiling point, with little liability of injury to the investment in casting.

Dr. Williams used a plunger with white plastic clay for casting gold in S.S.W. casting rings. This plunger was held in the left hand, while the blow-torch is changed to any desired angle in the right hand. This little outfit will accomplish any soldering and casting operation that is encountered by the dentist, while it does away with the worry of the cumbersome foot-bellows, rubber tubing, and the too frequent need of heating up the gasolene generator in cold weather.

*Clinic, Virginia State Dental Society, Richmond, November, 1915.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

REMOVING TIN FOIL FROM VULCANITE PLATES.—Small particles of tin foil adhering to vulcanite plates can be easily removed by mixing mercury with enough alloy to keep it from flowing, and rubbing this mixture over the plate.—*Pacific Dental Gazette (Dental Cosmos)*.

TIGHTENING THE LID OF A VULCANIZER.—The rubber ring of the vulcanizer is sprinkled with powdered meerschaum, the lid replaced, and the screw tightened, at first lightly, then more firmly as the boiling point is reached.—*Zahnaerztliche Rundschau (Dental Cosmos)*.

CLEANSING A FOUNTAIN SPITTOON.—From time to time the interior of the bowl of the fountain cuspidor becomes coated with deposits from the water. This coating is readily removed by very dilute nitric acid, which quickly dissolves the hard coating without the slightest damage to the bowl.—*S. M. Myers, Texas Dental Journal (Dental Cosmos)*.

IMPINGEING INLAYS.—In fitting gold inlays to cavity where there are intricate conditions or surfaces, heat inlays to redness (provided they are 22-carat gold). This will oxide them so that any impingeing surfaces can be readily seen and corrected.—*C. E. Allshouse, Chicago, Ill. (Dental Review)*.

MAKING WAX MODEL FOR AN INLAY.—To make certain that wax has been forced to all parts of a cavity, a thin copper band, loosely fitted about tooth, should be used in each case. It confines the pressure, and pressure causes a density of wax, so necessary for definite gold castings.—*W. D. N. Moore, Chicago, Ill. (Dental Review)*.

TAKING IMPRESSIONS IN PERSONS WHO HAVE WORN PLATES BEFORE.—It has been observed that after a person has worn a plate, especially one of vulcanite, for some time, the mucous membrane swells slightly. This is the reason why new plates often do not fit satisfactorily. As the mucous membrane returns to normal condition within about twenty-four hours, if no plate is worn, the patient should be requested to go without a plate for that length of time before a new impression is taken.—*La Odontologia Colombiana (Dental Record)*.

ORAL HEALTH

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Vol. VI.

TORONTO, JUNE, 1916

No. 6

EDITORIAL

Hygiene and Dentistry.

IT is a strange circumstance that for so many years scientific men have persistently disassociated disease of the oral cavity from that of the other parts. No doubt the early organization of dentistry as a separate profession has been responsible, in a large measure, for this condition. The administration of dentistry as a separate and distinct unit has not, however, in any way changed the micro-organism or its human habitat, and "disease" has remained "disease," whether the part affected was the oral cavity or some other part of the body.

It is to be hoped that the dental profession will not now make a somewhat similar mistake in failing to recognize the definite relationship between the problems of individual hygiene and modern dental conditions. Questions of air, food, digestion, exercise, and all other hygienic problems relate to dentistry just as much as they do to medicine. In fact, these problems are in part the problems of the dentistry of the future, and must be given most thoughtful study in their relation to the cause and prevention of dental disease.

It is reported that a dental infirmary has been established in New

York for the dental treatment of poodle dogs. Dogs do not ordinarily contract dental disease, but when brought under the baneful influence of modern civilization and allowed to live, sleep and eat as do modern humans, dental decay results. What a commentary upon our boasted civilization? Statistics show that diseases of the digestive tract are markedly upon the increase. Dental diseases are properly included in this classification. There is undoubtedly a direct relationship between modern habits of living and consequent disturbances of the digestive tract and the increasing prevalence of dental disease.

To-day is a day of great opportunity in dentistry. The future lies before and is richer in possibility for scientific advancement and human service than any of the days that have gone. Prevention must occupy a place of growing importance in the thought of every dental practitioner who desires to render the highest and best possible service to his patient and humanity.

Western Canada Dental Society.

THE Western Canada Dental Society will hold its Annual Convention in Regina on June 26th, 27th and 28th, 1916. A large attendance is expected, as some of the best known men in dentistry will give both papers and clinics. The manufacturers' exhibit is to be a big feature of the convention.—M. R. Parkin, D.D.S., Regina, Secretary, W.C.D.S.

Dental Operations.

PERFORMED BY OFFICERS OF THE CANADIAN ARMY DENTAL CORPS, IN ENGLAND AND OVERSEAS, JULY 15, 1915, TO MARCH 31, 1916.

Headquarters, C.A.D.C., 23 Earls Ave., Folkestone, April 9, 1916.

	Fillings.	Treats.	Dents.	Prophys.	Ext.	Devit.	Total.
July, 15 officers	1,856	576	119	113	1,370	478	4,512
August, 31 officers ...	5,875	767	509	604	4,613	988	13,356
September, 38 officers.	7,150	1,507	845	1,154	6,069	1,020	17,745
October, 42 officers ...	9,890	1,903	1,250	1,040	6,695	1,199	21,977
November, 42 officers.	10,759	2,621	1,351	1,066	6,995	1,546	24,338
December, 38 officers.	8,837	1,935	1,287	728	5,336	1,423	19,546
January, 61 officers ...	13,559	2,159	1,803	1,780	9,526	1,756	30,583
February, 61 officers .	13,263	1,842	1,686	2,000	10,371	1,454	30,616
*March, 64 officers ...	15,698	1,994	2,048	2,225	15,104	1,868	38,937
Total	86,887	15,304	10,898	10,710	66,079	11,732	201,610

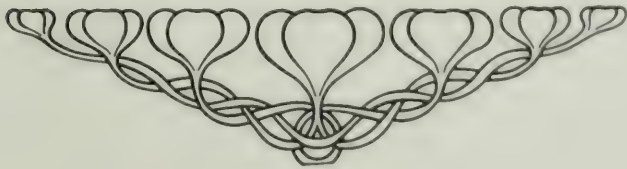
*Reports in full for March have not been received from the Dental Officers with the British Mediterranean Expeditionary Force and four officers in France.

J. ALEX. ARMSTRONG, Lt.-Col.,
Director of Dental Services, Canadian Contingents.

Dr. C. H. Gerrish, Exeter, N. H.
*Who Has Practised Dentistry For Over Fifty
Years, States the Following to be*

His Creed

IF CLEANLINESS IS NEXT TO GODLINESS
(GOODNESS) THEN BEGIN AND END THE
DAY WITH A PRAYER, FOLLOWED BY A
THOROUGH CLEANSING OF THE MOUTH
AND TEETH, THUS RENDERING YOURSELF
IMMUNE FROM DECEIT AND DECAY, THE
DEVIL AND DISEASE—FOR A CLEAN SOUL
AND A CLEAN MOUTH ARE MUCH TO BE
DESIRED.





THE LATE MAJOR P. P. BALLACHEY
Second in Command 58th Batt.
Died a Hero in Active Service
Flanders, June, 1916.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, JULY, 1916

No. 7

Dental Hygienists.

R. J. READE, M.A., D.D.S., M.D.C M., TORONTO, CANADA.

[EDITORIAL NOTE.—*Don't fail to read this article. The question of the dental nurse is one of the most important problems confronting the dental profession to-day. Dr. Reade has referred to a number of important matters which should be carefully considered before the profession is further committed to the so-called "oral hygienist."*]

THE oral hygiene movement, which in the past few years has been carried on so vigorously, has resulted in the awakening of the medical profession and the laity to such an extent that there has arisen a great demand for dental treatment. The demand has been made a pretext for introducing the dental hygienist or nurse. The New York Legislature has passed a bill dealing with the question of dental nurses. In part, the bill reads as follows: "Any dental dispensary or infirmary, legally incorporated and registered by the regents, and maintaining a proper standard and equipment, may establish for women students a course of study in oral hygiene."

The thought that immediately presents itself is: Why confine the license to women, should men not have an equal right to perform the same kind of work?

The object of introducing the dental nurse, is to overtake the work caused by the great demand for dental service, brought about by the oral hygiene campaign. How far is this legislation regarding the dental nurse going to help the case? The bill says: "Such dental hygienists may remove lime deposits, accretions and stains from the exposed surfaces of the teeth, but shall not perform any other opera-

tion on the teeth or tissues of the mouth." Very little is the case likely to be helped, for the great need is to get the teeth filled. If the sphere of action of the dental nurse is limited to the removal of accretions on the teeth, then the licensed dental nurse is introduced, and yet practically no means gained to do the enormous amount of work needed.

Why limit the nurse to cleaning teeth? Cleaning teeth is a vague expression. Who shall say where the act of cleansing ends, and where the operation for the treatment of pyorrhea begins? The skill of the dental nurse must be great, or the injury to the patient irremediable. The removal of accretions from the teeth is one of the most important operations in dentistry, requiring the greatest skill to avoid injuring those delicate tissues, the destruction of which means the loss of teeth. There would be far less chance of doing injury to the patients if the nurses, instead of cleansing the teeth, were to perform other dental operations, for instance, to take impressions of the mouth. The worst that would probably happen would be a failure to get the impression.

It would require little education of a capable nurse to enable her to get a wax model of an inlay from a properly prepared cavity. In general surgery nurses change the dressings of wounds. Surely a dental nurse could change dressings in the roots of teeth.

Where will all this end? Artificial distinction can be maintained only so long as the power remains in control of those interested. But let some leader arise who knows the conditions that obtain, and who will comprehend that if the dental nurse can be trained in so short a time to perform one of the most important operations in dentistry, it would appear to be only the law that keeps the public from receiving more abundantly the benefits of dental science. The people will demand that the barriers be broken down, and that the benefits of dentistry be not withheld from them, because of legislation in favor of the dentists.

This new legislation of the nurse is leading to this end. Because there is too much work to do, the dental authorities in New York are seeking to get assistance to help the work. When the Government and the people see that there are not sufficient dentists to do the work, then the demand will be made for more. How will this demand for more be reconciled with the demand of the profession to raise the standard of dental education from three to four years?

Let the dental profession once acknowledge that one year will prepare the dental nurse for the important work of removing tartar and stain from the teeth, then it will not be difficult to prove to the Government that a two years' course would amply prepare a man for extracting teeth, making plates, filling root canals, preparing cavities and inserting inlays and fillings. The Government will say the need is so great that we should not give so much time to such subjects

as physiology, anatomy of the arms and feet, bacteriology, microscopy, etc. And is there some force in such an argument? It is the logical outcome following the introduction of the dental hygienist.

But what would the result be? A lowering of the dental standard. Then which from the standpoint of dental profession is more desirable, the elevation of the dental standard, or the introduction of the licensed dental hygienists?

If it were possible to stop with the defined duties of the hygienist, the result would not be so dangerous. But it is hard to conceive how such a limitation could be logically maintained in the face of the enormous amount of work waiting to be done.

We would tend toward the condition of affairs as now obtains in England. In England the law protects all those who practise dentistry without a license, provided they do not use the title of dentist, or some such designation, to deceive the public. So far as any one is able to render satisfactory dental service the law protects them, and allows them to give their services, and receive payment for the same. The authorities claim that the poorer part of the population should be able to have their teeth attended to. This they would not be able to do if only the registered dentists were practising. Further than this, it is claimed that for the practise of dentistry no such great preparation is necessary as is claimed by the dental authorities. Therefore, if an individual desires to practise dentistry he may do so, but at the same time he is liable for suits of malpractice.

In the State of Massachusetts there is an act relative to the registration of the dental nurse. The nurse may be either a man or a woman. First, we notice that any public or charitable institution may employ any number of nurses. Next, note the operations that may be performed by the dental nurse. First, the examination, whatever that means and includes. Second, cleansing. What a loose expression this is. It is so vague that it may strike at the root of the science of dentistry.

Registered dental nurses shall be licensed to perform only such duties as shall be specified in his or her license, and solely under or by the direction of a registered dentist. No dental nurse shall be licensed to perform any services other than the examination, cleansing, wedging, and taking modelling compound or wax impressions of teeth, inserting and changing dressings in teeth for the relief of pain, and assisting a registered dentist during the performance of his dental operations.

Whatever else may be said, this is certainly giving to the nurse a credit for a knowledge that applies to the medical side of dentistry.

It would be small wonder if a Government would protect a profession that admitted the fact that a dental nurse with little education, compared with that required by the dental student, could perform the most important operations in dentistry, namely, make intelligent exam-

inations, cleanse the teeth, and treat them to relieve pain.

Without a license, an assistant makes crowns, inlays, dentures. What difficulty would there be in getting on without the dentist when we have the dental nurse and the laboratory man? There would be no difficulty if the nurse could do what the Act allows.

Again the Act reads: "No dentist shall have at one time more than one registered dental nurse in his employment." It would be very hard for a layman to understand such a provision. If the nurses are able to do the work, why limit the number employed; if they are not able to do what is required, why allow them to operate on the patient?

We are daily learning of the great increase in the demand for dental work. It is reported that in a certain school section the trustees were considering the medical and dental inspection of the school children. The dentists were not enthusiastic. This astonished the trustees, and they pointed out to the dentists that if the trustees carried out the plan that hundreds of children would be sent to the dental offices, ready to get work done at reasonable fees. To the astonishment of the Board, the dentists replied that they were not anxious for that sort of work, and that they worked for children as little as possible.

If the profession does not care for this work, what is to be done? What is the solution of the difficulty? Will the dental nurse solve the problem? She would only be allowed to cleanse the teeth, but that would not fill the children's teeth. Shall people be allowed to practise dentistry without a license, as in some countries? Or would a two or three-year course be the wisest plan to adopt? It, at all events, would be better than an indiscriminate practise of dentistry.

Employees of Canadian Dental Supply Depots Serving with His Majesty's Forces.

CLAUDIUS ASH & SONS—

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W. T. Bleakley, Major, 126th Batt., C.E.F.

Duncan Pollock, Sergeant, Canadian Army Dental Corps.

W. Windeyer, Major, 234th Batt., C.E.F.

GOLDSMITH SMELTING & REFINING Co.—

P. N. Alexander, Lieutenant, 2nd Batt.

J. Price, Sergeant, 198th Battalion.

LEIGHTON-JACKES MFG. Co.—

R. Wallis, Private, Ammunition Park.

Colon Sinclair, Private, 48th Highlanders, Prisoner in Germany.

Evan Luno, Lieutenant, 2nd Canadian Mounted Rifles.

“Gassing” and Its Effect on the Oral Tissues.*

CAPTAIN J. G. ROBERTS, C.A.D.C.

I WISH to acknowledge publicly that I am permitted to address you on this occasion by the courtesy of my superior officers, Captain W. G. Thompson, Officer Commanding Dental Services, Military District No. 2, and Major W. B. Clayton, Officer Commanding Dental Services, Headquarters, Ottawa.

Much has been said and many articles have been written in reference to the surgical restorations that have been made and the wonderful results following the different methods of treatment given our soldiers at the front and in the different hospitals in the mother land, but sir, I believe this is the first occasion on this continent in which a body of professional men has been brought face to face with the question of “Gassing” and its effect on the oral tissues.

I have been requested by your president to prepare a short paper and give an account of the oral lesions that have come under my observation. In doing so, I state with pleasure that many members of the medical profession fully realize the importance of having the mouth and its tissues in a healthy condition.

For your information, I may state the cases I have treated are principally from the first battalions sent overseas from Canada, viz: 1st, 2nd, 3rd, 4th, 5th Canadian Mounted Rifles, C.G.B.G., and last, but by no means the least, “The Princess Patricia’s Canadian Light Infantry.”

For convenience, I shall divide the cases that have come under my notice into two classes:

1st. Those persons who had given little or no attention to the oral cavity before enlistment. I may be permitted to point out that the professional men who examined these soldiers appear to have given little attention to the mouths of these men. Apparently they did not realize the baneful effects of septic absorption, particularly in men who were about to engage in a strenuous life where all their energies were about to be brought into active service.

2nd. Those men whose mouths had been given careful treatment before enlistment.

The local symptoms in persons who have been “gassed” are usually pronounced and are readily distinguished.

In the first class, “where no attention has been given,” we find decayed teeth, abscessed roots, deposits around the necks and extending under the gum margins. These deposits vary in color from an almost black shade to a dark brown. Around the necks of the teeth pus exudes in varying quantities. The gums are highly vascular, and

*Delivered before the annual meeting of the Ontario Medical Association, Toronto, June 2, 1916.

are shaded from a deep purple to a bright scarlet. They are usually extremely sensitive to the touch and bleed freely with the slightest pressure. Many of these soldiers report that the soft tissues were so sensitive in a few days after being "gassed" that they were unable to eat any solid food and were forced to take tepid drinks only.

In the second class, "those whose mouths were in a healthy condition at the date of enlistment," there are usually deposits, in many cases, with pus exuding. The local inflammation seems much more acute. The bleeding is more profuse, and the tissues markedly sensitive. On account of pain little or no attention has been given to the teeth and gums after these men were gassed, hence the processes of inflammation and absorption work along without interruption. I desire to call your attention to the baneful constitutional effects of this septic condition. The same constitutional effects are produced whether these are taken into the stomach by the alimentary canal, or are absorbed into the circulation directly.

Many of you have seen cases of arthritis, myelitis, and disordered action of the heart. I refer you to that admirable paper by Dr. Weston A. Price, of Cleveland, read at the annual meeting of the Canadian Oral Prophylactic Association, Toronto, February 14, 1916. By a careful perusal of this very valuable and scientific contribution much information may be gained and the importance of septic absorption may be understood.

Many cases have tubercular lesions, some with T. B. family history, others having contracted since enlisting. The principal difference is a slower bleeding, but more continued. One very marked symptom in almost all of the cases I have seen is the extreme nervous condition of the patients. This may be attributed to the heavy work of the campaign, the great shock to their systems, the vast amount of nervous energy and physical force consumed while in action, and I believe, in many cases, the greatest of all, septic absorption. Some patients are so unstrung that it is with difficulty a glass of water is raised to the mouth.

The course of treatment is similar for all the different classes I have enumerated, viz: The complete removal of all roots and teeth that cannot be restored to a healthy condition. The thorough and gentle removal of all deposits, rough surfaces whether on teeth or roots. The breaking up and obliteration of all plaques, etc. All necessary fillings should be inserted as soon as the condition of the mouth warrants.

The soft tissues respond to careful treatment of warm, mild anti-septic and normal saline solutions.

Those solutions with a glycerine base appear to have the greatest soothing effect, particularly when used in a very weak solution and as hot as can be borne.

Several treatments are necessary, particularly when abscessed roots

have been removed, and also where the inflammation is most marked. Many of these soldiers have badly coated tongues, fetid breath, etc., due in many cases to the poison absorbed and to constipation.

Beneficial results are obtained in T. B. cases by an extra dose of oil. In ordinary cases magnesium sulphate in a small dose with a copious draught of water. The local treatment should be strictly palliative. After a time, when conditions warrant, gentle massaging of the soft tissues is beneficial.

Most of you are aware of the disastrous effects of "gassing" on lung tissue, and of the difficulties that are met with in treating such cases successfully. I may point out the probability of having to treat cases new to us when our soldiers return from the battle fields of Southern Europe, Asia and Africa. It surely behooves all thinking professional men to be alert at this period in our history. I do not believe it is a question of monetary remuneration that prompts us in our different tasks, but a higher and nobler purpose of rendering our intelligent services to the best manhood of our land, who are offering their lives on the altar of sacrifice that the principles we hold dearest may prevail: Our faith and loyalty to the British Constitution, the defence of the weak, the respect for the honor and virtue of womanhood, and those grand Christian principles laid down for our guidance by Almighty God.

If we are true to these principles, surely we should give our best efforts and thoughts to these men who have gone forth, fought, bled and suffered for us that our honor may be preserved and the sanctity of our homes secured. We shall then have the satisfaction of having done our manly duty, and one reward will be, "Inasmuch as ye have done it unto one of these, the least of my creatures, ye have done it unto me."

Hospital Patient Refused Dental Treatment.

DR. J. A. BOTHWELL, in charge of Dental Services, Toronto General Hospital, reports that a ward patient, suffering from stomach trouble, was recently peremptorily discharged from the hospital because of refusal to allow the hospital dentist to put his mouth and teeth in a condition of health.

TO PLACE A CEMENT FILLING.—When I place a cement filling I dip the plastic instrument in alcohol, shake off excess and proceed to place the filling, which overcomes the difficulty of having the cement cling to the instrument. Is this not better than using grease on the instrument, which becomes incorporated in the filling material to its detriment?—*Edward D. Ralph, D.D.S., Dental Digest (British Dental Journal).*

Horticulture—A Hobby for the Dentist.

DR. FRANK E. BENNETT, OF ST. THOMAS, RENDERS IMPORTANT
PUBLIC SERVICE.

[Last month ORAL HEALTH published an illustrated account of the wonderful garden success of Dr. Donald Clark, of Hamilton. In this issue the splendid results of Dr. Bennett's efforts in connection with the St. Thomas Horticultural Society are described. The work of Dr. Bennett in Horticulture is good citizenship of a type worthy of emulation by many other members of the dental profession.]

IN many local Horticultural Societies the chief benefit accrues to the individual member of the society, but some years ago Dr. Frank Bennett, of St. Thomas, conceived the idea of making the St. Thomas Horticultural Society a bigger and better society than it had ever been before, by securing an annual appropriation for the laying out and maintenance of a number of boulevard flower beds throughout the city. The citizens of St. Thomas have appreciated this effort, and the membership of the Horticultural Society has increased from one hundred and twenty-seven to fourteen hundred, and the number of public flower beds has increased in like proportion.

Membership in the St. Thomas Horticultural Society has come to mean something more than the mere payment of an annual fee. The members are able to secure bulbs, shrubs, roses, etc., practically at cost. The increased buying power of the society has become a large factor in its success. Orders are sent direct to the growers for shipments in carload lots. Last fall 125,000 bulbs alone were purchased, besides palms, aucubus, boxwoods, etc. This spring over 4,000 roses, 1,000 shrubs, 20,000 gladioli and 500 peonies were distributed and sold among the members. The repetition of this effort each year will soon establish St. Thomas as the recognized "Flower City" of Canada.

Dr. Bennett, the President of the Society, and his co-workers have made frequent pilgrimages to Rochester, N.Y., for ideas and suggestions, and it is planned to model Pinafore Park, St. Thomas, after Rochester's famous Highland Park. Pinafore Park already contains a collection of sixty varieties of lilacs, 150 varieties of peonies, 100 varieties of hardy phlox, 125 varieties of dahlias, 150 varieties of iris, splendid collections of Japanese maples, narcissi, lillies, roses, delphinium, rare trees and shrubbery, all donated by the Horticultural Society to help put St. Thomas on the "flower map" and make her "somebody."



A Section of the Tulip Exhibit of the St. Thomas Horticultural Society Show

Dr. Bennett is enthusiastic in his work as President of the Horticultural Society, frequently being up at five o'clock in the morning arranging the work of the men in planting out the flowers. With one hundred and sixty boulevard beds throughout the city, the work of planning, planting and maintenance is no light task. There will be planted this year in these beds about 8,000 geraniums, cannas, salvias, etc.

The plans being worked out for the citizens of St. Thomas along this line lead the whole Dominion, and it should give the dental profession a great deal of pleasure to know that one of their own number has been the moving spirit in this enterprise.

Dr. Bennett was born in St. Thomas and has always taken a prominent part in its public activities. He has, for many years, been a member of the Board of Education, having been chairman of the board in 1915 and of the buildings and grounds committee in 1916. This, no doubt, accounts for the fact that the school grounds of St. Thomas are noted for their beautiful lawns and flowers. Dr. Bennett attaches great importance to the creating of a proper environment for the citizens of a community, and by surrounding the boys and girls with an abundance of flowers and training them in their appreciation and care, hopes that these influences will reflect themselves in a better type of citizen as the years go by.

St. Thomas specializes on the tulip, of which over two hundred varieties are planted in the gardens and on the streets of the city. The horticultural beds alone contain 25,000 bulbs of innumerable varieties. A conservative estimate would be over one-quarter of a million bulbs in the city and the work has only begun. One hundred and eighty-seven varieties were planted this spring, and at the early spring show the society exhibited sixty-five varieties, and at the Dar-

win show one hundred and ten varieties of Darwins and May flowering. The following are a few of the popular tulips: Early singles, Pink Beauty, President Lincoln, Flamingo, Albut Cuyp, Wouwerman, Van der Neer, Proserpine, Joost Von Vondel, (white) Calypso, May flowering, tulips Macs, Elegans Alba, Mrs. Moon, Moonlight, Ellen Willmott, Yellow Perfection, Inglescombe pink, Turenne, Louis XIV., The Fawn, John Ruskin.

The May flowering are particularly beautiful, and for size compare with the Darwins. Darwin tulips are all beautiful, a few of the new varieties being Sir Trevers Lawrence, King George V., Isis, Whistler, La Tulipe Noir, Frau Angelica, Prince of the Netherlands, and the well-known varieties: Europe, Psyche, Rev. Ewebank, Clara Butt, White Queen and Farncombe Sander. The height of these Darwin tulips varies from twenty inches to about three feet. Remembrants, Parrots, Double, Botanical and Bybloom tulip are to be seen in some gardens, but as a rule are not as popular as the other varieties. In the double, William III., Murillo, Courenne D'Or, Muriage de Ma Fille and Blue Flag are excellent varieties. Hyacinths are very inexpensive, and every one should plant a bed or force some in water or in pots for the house or office.

The St. Thomas "Festival of Tulips," held in May, was the first of its kind to be held in Canada and was a grand success. Visitors attended from points as far east as Ottawa and from Detroit on the west. It is planned to make this "Festival" an annual event. Plans for 1917 are already being made, and it is hoped readers of ORAL HEALTH, who are lovers of tulips, will visit the "Flower City" next May. The presence of a number of dentists from different points in Ontario would be welcomed by Dr. Bennett and would be a most practical form of encouragement.

TO POLISH RUBBER DENTURES.—After the plate is filed, scraped and sand-papered, instead of the felt cone use a cone made of a wine cork, one end of which is screwed into a chuck and the other end rounded with a file while the latter is revolving. On this use pumice in which has been incorporated some emery dust moistened. This cuts much faster than pumice alone, and will take out the scratches left by the sand-paper very rapidly. Follow this with pumice without the emery, then use whiting moistened with ammonia. If a fine polish is required employ prepared chalk and ammonia after the whiting. The commercial whiting contains considerable grit, and while it will polish it leaves many shallow scratches which the fine chalk eliminates.—*F. J. Patterson, Mendota, Ill. (Dental Review).*

In Appreciation of the Late Major P. P. Ballachey.

WRITTEN BY W. NELSON CUTHBERT, D.D.S., BRANTFORD.

THE late Major P. P. Ballachey was born in the County of Brant, and adjacent to the City of Brantford, in which place he received his collegiate education preparatory to his entering upon the study of dentistry in the Royal College of Dental Surgeons of Ontario, as affiliated with the University of Toronto.

Dr. Ballachey was graduated from Toronto University and the R.C.D.S. of Ontario in the spring of 1899, and immediately entered upon the practice of his chosen profession in the City of Brantford, where he enjoyed a successful and prosperous practice for over fifteen years.

Belonging, as Major Ballachey did, to the Dufferin Rifles, Brantford, he felt it his duty to join in the present great conflict of right and justice against wrong and tyranny, which had suddenly forced itself upon the world, and when the call came to him to leave all and go to the front he complied, gave up his dental practice, his wife and family of three little children, to join the 58th Battalion for overseas service.

His home, where he conducted a residential dental practice, was made the headquarters for the 84th Battalion's officers while resident in Brantford, Mrs. Ballachey with the children having, in the meantime, gone to Long Beach, California, to be near her parents in order to mitigate, in some small measure, for the anxiety they all felt on the doctor's entry into active military service.

Major Ballachey had belonged to the military organization of the city for some years—the Dufferin Rifles of Canada—and at the time of joining the 58th Battalion was junior major in the Dufferin Rifles, and subsequently held the office of senior major, and second in command of the 58th for overseas service. His battalion, the 58th, soon reached the front, and Major Ballachey was killed in battle on June 14, 1916, on the very day on which Mrs. Ballachey had returned with her family to Brantford (their residence having been vacated again by the going forward of the 84th Battalion overseas), and their return on the day of Major Ballachey's death in battle is a very sad and strange coincidence. What makes this harder for Mrs. Ballachey to bear is the fact that Major Ballachey had been recommended for appointment as commandant of one of the Canadian military training camps, and had he been spared a few days longer would, in all human probability, have been back in Canada again near his family.

Dr. Ballachey's death came as a sudden shock to the community.

and particularly to the people of Brantford, where he was so well and favorably known.

Major Ballachey was for ten years an active member of the Public School Board of Education for Brantford, during which time, chiefly through his influence, dental public school inspection was established in our city schools. The public schools of the city, as a mark of respect to his memory, each flew a flag at half-mast for several days, and at Grace Church (Anglican), where he was a devoted member and attendant with his family, the flag of the church hung at half-mast from the church tower during the Sabbath afternoon of June 18 in sad recognition of his passing away, and fitting reference was made at the morning service by the Rev. Dr. Mackenzie, the rector. A special hymn was sung by the church choir to his memory. As on many past occasions he had attended his church with the Dufferin Rifles, when special services were held for the military, these were fitting tributes to his memory.

Major Ballachey stood for everything which was for the benefit and advancement of Brantford, and he was known in his professional career as a conscientious and painstaking practitioner, and was honored and respected alike by all. Dr. Ballachey was much devoted to his wife and family of little children, who will miss him most. But the Lord's ways are past finding out, and our friend, Dr. Ballachey, has fallen bravely and valiantly, doing his duty to his God, his King and his beloved country and the Empire of which it forms a part. He died leading on his troops on the battle field in Flanders, and we all feel that he certainly sacrificed his all to his country's service in time of war, and we therefore extend to his bereaved widow and family of little children, and also to the other members of his family, and particularly to his father (his mother having predeceased him), who feels keenly the great loss he has been called upon to bear, our unstinted sympathy.

The staff of the Royal College of Dental Surgeons, and those members particularly of the graduating class of '99, will miss his kindly and genial presence when future dental meetings come to pass at the college.

Major Ballachey's untimely death on the field of battle, in the prime and vigor of life and manhood we deplore, as the sacrifice he made was truly great, and greater service can no man perform than to lay down his life for his country. It may be truly said of Dr. Ballachey that "he loved Honor more than he feared Death." His was a death on the Field of Honor.

"Like the memories of a sad dream come the thoughts of bygone friends; sad are the thoughts as dear were the friends."

The Correct Basis for Fixing the Dental Fee.

BY A CONTRIBUTOR.

THE method of computing charges for dental services has been adopted very largely, it is believed, by the individual upon the precedent established by his predecessors, or his contemporaries in the vicinity in which he is located.

Whatever may be the teaching in our institutions at the present time, there is no doubt but that it was not many years ago that the college course contained nothing that might be considered a guide as to a fair and comprehensive means of estimating charges.

Those who have been established for a score or more years have, in the majority of cases at least, continued to be wedded to the haphazard and ill-considered arbitrary figures. Later consideration and teaching has abundantly proved that in arriving at the conclusion as to cost, very much more has to be considered than the bare expenditure upon the materials used or the subsidiary substances involved.

It is not intended in this article to enter into the question of proportionate involvement of the expense of education, loss of productive years, cost of furnishing and equipment, or reserve stock on hand. The fact that these and all overhead expense should be faithfully considered has been sufficiently emphasized by others.

Taking it for granted that it is almost entirely the practice to fairly consider these matters, it is in the writer's mind to deal with that phase of the larger subject as suggested in the title of this paper.

It is admitted at the outset that the writer has not adopted, as his basis of charges, the time involved, except in a limited degree. That the matter is prominent in his mind and that it is made subject of the present discussion, has been through the disagreement over charges and a consequent correspondence which, to say the least, revealed a peculiar attitude. The transaction and correspondence referred to are considered of sufficient interest as to be given a place herewith. The fact that the complainant is a member of the Supreme Court Bench accounts for the willingness on the writer's part to enter into the discussion so fully, and it also makes more amazing the charges and the demands made. It has been the habit of the writer for a number of years to simply present a statement of the total amount of the account involved, being prepared on demand to submit an itemized bill. The gentleman just referred to has, within recent years, paid without question even larger amounts than those of the individuals included in this; exactly the same basis for estimate having been made. Having received an itemized statement of this, however, he presented a letter in which, among others, the following

statements were made, *i.e.*, "alleged professional services," "little short of polite form of robbery," being kind enough to include the whole of the resident dentists when he refers to the "staggering bills of the ——— dentists."

Upon the suggestion being made that the account be submitted to non-residents in the profession, his answer was "that would be like trying a goose before a jury of foxes."

The real intent of the letter is shown in the following demand: "Send an account showing number of attendances, the time spent, and the value of materials used, and I shall attend to the payment of a reasonable compensation."

That the judiciary had conferred upon it the right to be the sole arbiter of professional charges outside of its own is surely surprising, if such a claim is made as is seemingly intended. The response to the above was that so far as the sender of the account was concerned, fees were not based upon the time element or upon the actual expense involved. The value and service rendered, the judgment and facility involved, and the special experience drawn upon, were all considered when the specific case was completed and the charge made.

His request for items of cost of material and other things involved was dealt with rather factiously. It was stated that to arrive at this it would be necessary to figure the cost of actual and subsidiary material used, wear and tear on instruments and appliances, share of cost of office assistants, light, heat, power, rent, insurance, etc., beside the share in the interest on the cost of professional training, and finally there would have to be a charge made for the time expended in securing the above figures to make the estimate.

The conclusion of the final letter from His Honor reads as follows: "I want certain information, information to which I am entitled, and without which in a court of law you would be disentitled to recover. You do not furnish it. What then?" In course of professional contact the writer referred to the attitude taken (without mentioning names) to members of five other professions. The case was unique in the minds of all. A physician stated that he had never in his experience prepared an itemized account.

Following the last mentioned letter, the writer sent a short note to the effect that believing that the distrust manifested was unchangeable, it was an honor to enclose the account *cancelled*. A month having passed with no sequel, it would appear that the judge has had his desire fulfilled.

It can readily be understood why the question as to the desirability of having a fixed stated hourly fee has been prominent in the mind following such a controversy. That opinions differ in this matter is not surprising. The desire in this paper is to seek an expression of opinion and secure the reasons that would account for

preferences. If it is the will of the editor of this magazine, the writer would be gratified if the advocates of the various methods of computing charges would present at some future time their reasons for believing the adoption of such as the most satisfactory. It would seem that it is possible to have rather diverse opinions on the one matter, as is manifest by two further quotations from the oft-mentioned correspondence. The following are taken from the one letter:

"Services rendered and the benefits flowing therefrom, and not the ability to pay, should form the true basis of payment for professional charges. It is true that in my own profession it has the sanction of usage that counsel fees are augmented or depreciated according to the magnitude or the triviality of the financial interests involved."

The other statement is worthy of note, not only because it seems to contradict the foregoing, but also because it contains gratuitous information of a legal character that might be of real value in the contingency of a suit being entered into in connection with any further case.

"Let me point out to you one or two fundamental principles which, well known to the lawyer though they may be, may not, perhaps, be quite understood by the layman. One is that (assuming that there had been no scale of dentist's fees fixed by the Legislature, which I understand to be the case), in the absence of agreement as to prices, a dentist can recover for his services just as much as those services are reasonably worth and no more; worth, mind you, not in the eyes of the claimant himself, but worth in the eyes of the jury. Another principle, a corollary of the first, is, that in order to demonstrate the value of your services it would be necessary and incumbent upon you to show the length of time that it took to perform them. You will, I think, yourself realize how utterly impossible it would be to arrive at any just conclusion, or to apply any known standard of valuation with absolutely no knowledge of the essential element of time."

Having exhausted the above personal matter of all (and possibly more than all) its phases of interest, it will be well to enter upon the discussion of the intended topic.

In considering the various ways in which charges have been estimated the following may be taken to cover the ground:

One which it seems is most universally adopted is that of definite stated cost for definitely outlined work, with little variation, it may be, except for such work as gold restorations, where it is estimated that the cost of the inserted article has to be definitely appreciated.

A second method is where a minimum for every kind of work is agreed upon and the charge graded up contingent upon difficulties overcome or expense involved.

Another that can be mentioned is a definite consideration alto-

gether on the skill and experience brought to play and the benefit of the results derived. A combination of the last two mentioned is the method adopted by the writer, largely, so far as the minimum fee is concerned, to conform to an arranged schedule of the majority of the local practitioners; but at the same time being a free agent to judge on the merits and the reward due in connection with each piece of operative work. In passing it may be said that the idea of suiting the fees to the pocket-book has not met with approval, except in so far as a closer adherence to the minimum standard is frequently adopted, in spite of the extent of the operation, in cases of those who are financially weak.

The last of the methods of computing fees that is to be mentioned is that of estimating by time consumed. That this method is adopted by so many is a sufficient evidence that it has its merits, and while not approved by the writer, may have advantages that, when presented, might carry unexpected weight.

As between such a plan and that of charging by the intricacy involved, the skill manifested and the result secured, it seems that the latter is distinctly more professional. It seems almost impossible that such a plan could be adopted in surgery, but if it were, those who took advantage of such would surely not be in the same class for professional prominence as those whom we can call to mind who have achieved even international notoriety by making fees according to reputation and acknowledged ability.

Those who have arrived at the stage in the practice of law where their advice is so highly valued, do not in the slightest estimate the worth of their decisions on the time consumed upon their preparation, but upon the bringing into play the results of experience and knowledge. Through the effort of work of years the dentist also accumulates that judgment, skill and facility which render his service increasingly valuable, insofar as he at the same time endeavors to keep in the line of progress. Beside the increasing knowledge, the experienced practitioner achieves a facility at his work that permits him to accomplish more and more in a given period. If he is to derive advantage from this it must mean that the amount received for this period of work must be proportionately large. At the same time there are times when, through personal energy, he is enabled to perform more or less than at others. In such a case it is only fair that the patient should be asked to pay for what has been accomplished without entire regard to the time involved.

It might be heresy to suggest that the sole consideration of the time element might tend to diminish the speed of the operator. In any case it can be admitted that the incentive that comes with the knowledge that special effort and increasing product will secure its due reward is by no means unworthy of consideration.

As professional men we are probably, on the average, more likely

to live true to our obligations than are the so-called laboring classes; but it is a known fact that many employees would prefer to choose their own assistants and pay them according to their worth, than to be dictated to, according to union rules, as to who shall be their workman and the exact amount that each shall be paid, regardless of merit or speed.

It would be interesting to know which of the two methods—time or service—would receive the more favorable consideration of a jury in case of a suit in connection with fees. The proper presentation of the case would considerably affect matters it is sure, but it appears to the writer that a definite statement as to exact earnings as per hour would to the ordinary jury seem unreasonable, as in that case they would be measuring by a standard with which they are familiar and from which the professional aspect would lose most of its consideration. One thing seems quite evident, and that is that the practitioner that has to do with that form of clientele which involves many calls, with examinations, relief of pain, extractions, anaesthesia, and attention to artificial dentures, will not be able to adopt a time basis without serious risk of being involved in difficulties with his patients, who will so often be on their guard so as not to be defrauded. Accusations have been made that the adherents to the time basis have “loafed on the job,” but of course this is not true. Unfortunately, the accusation is not made to the operator at the time, but to his successor when the aggrieved one has changed his dentist.

From the patient's point of view it has been frequently observed that when a specially gratifying result has been achieved in spite of serious obstacles, that the fee question has an unimportant part, comparatively, in the matter.

Satisfied patients, both as to the quality of the work performed and to the ready acquiescence to charges, lends materially to the comfort of practice, and whether this has been achieved by the performances of the individual dentist is a matter of which he is the best judge.

The question arises as to the method of adjusting charges for time in connection with laboratory work, where most of this is done by assistants, the chair work being attended to by the practitioner.

The results of experience in the adopted method of making charges has, after careful computation, shown that the gross and net receipts are more, rather than less, than what is understood to be the adopted standard of those who have a fixed hour fee, so far as this country is concerned at least.

Personally, there is the belief that the value of each minute's work is variable, and that it frequently occurs that what is accomplished is really worth little more than the actual cost involved, and sometimes not that much.

In other cases the contribution of a very few minutes' actual effort brings about results that entitle to remuneration far in excess of the ordinary.

While the writer is open to conviction as to the possibility of the time basis being the more satisfactory, it is improbable that even if such a conclusion were arrived at, that a change would be made. The education of a clientele along the line of a certain procedure, and the continuance of it over a long period, make the possibility of a radical change rather a formidable prospect. At the same time the presentation of the advantages of any favorable procedure will always find those who are in a position to take advantage of it.

Prescription Writing in English.*

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[The following article is published by courtesy of the "Journal of the American Medical Association," and discusses in a common sense way the use of Latin in prescription writing. The subject will, we feel sure, prove of great interest to the members of the dental profession.]

IN the report of medical curriculum of the Council on Medical Education of the American Medical Association, the following position is taken by the sub-committee on Prescription Writing concerning the use of Latin:†

The committee considers Latin desirable for the names of ingredients (inscription); indifferent as to the directions to the dispenser (subscription); and objectionable as to the directions to the patient (signature). The student should, however, know the meaning of the Latin phrases which are commonly used. This amount of Latin may be readily taught in the course, so far as this subject is concerned.

While this report was not acted on by the Council, it may be considered the most recent authoritative statement in this matter. It commits us to the use of Latin in at least a portion of the prescription.

The arguments advanced in favor of Latin prescription writing are as follows:

1. "The Latin names of drugs are more definite, concise and unchangeable."

*From the Pharmacologic Laboratory, University of Illinois, College of Medicine.

†Report of Sub-committee on Pharmacology, Toxicology and Therapeutics. Section 4 of Report of Committee on Standard Curriculum for Medical Colleges, American Medical Association, p. 7.

2. "A Latin prescription can be compounded all over the civilized world."

3. "Latin prescriptions are used internationally in medical literature."

4. "It guards the patient against knowledge that might be prejudicial: (a) as to the physician's intention; (b) as to greater ease in securing the prescribed drug without a prescription, with possible formation of habit or other detriment."

5. Better form is preserved. "To encourage the use of English official names would easily lead to the use of unofficial English, or common names, which often are indefinite; less pains would be required in mastering the art, and the results would be probably greater laxity in prescribing and less familiarity with the official substances."

Let us analyze these arguments.

1. The first reason advanced cannot stand, as the *English official names for drugs and preparations are just as definite and concise as are the Latin names*; and the latter are no less changeable, as is evidenced by the changes in the official names occurring at pharmacopeial revisions. We must not confuse, in this connection, the *English official names*, which are given in the pharmacopeia alongside of the official Latin names, with the common English names, or synonyms, such as: Paregoric, Hoffmann's anodyne, Epsom salt, golden seal, Indian hemp, etc., which often are given in the pharmacopeia after the official English name.

2. As to the second reason, it may be considered very *doubtful whether it is ever desirable for a patient travelling abroad to have a prescription refilled without medical supervision*. Even when the patient stays at home, indiscriminate refilling of prescriptions is not desirable. When the patient travels, there is added the lack of international uniformity of strength of preparations (excepting in the case of some of the poisonous medicaments) that might lead to undesirable results, if a prescription calling for a U. S. P. preparation were filled with a preparation of another pharmacopeia having the same or similar name, but a different strength.

That there is a considerable disparity in the strength of preparations of various pharmacopeias may be seen from the few examples given in Tables 1 and 2. That there are not only differences in strength, but even qualitative differences in composition, may be seen from the fact that the compound infusion of senna contains magnesium sulphate in the United States and British pharmacopeias, and potassium and sodium tartrate in the German and various other continental pharmacopeias. There is also a considerable difference in the use of correctives; but, most of all, a decided difference in strength: the United States preparation representing, for instance, 6 per cent. of senna, while the Austrian preparation represents 12 per cent. Fancy the predicament of a traveller who buys his compound effec-

vescing powders or compound infusion of senna in different countries; he is doomed to either disappointment or discomfort. With troches of santonin, wine of colchicum, tincture of lobelia, or fluid-extract of nux vomica, the result might easily be worse.

The one prescription in a hundred thousand or perhaps a million that is carried abroad and filled there should not only be translated

TABLE 1.—STRENGTHS OF PREPARATIONS IN VARIOUS PHARMACOPEIAS, GIVEN IN PERCENTAGE OF ACTIVE INGREDIENT.

	U.S.	German	British	Others
Liquor sodii hydroxidi	5.	15.	20.0	
Oleum phosphoratum			1.0	0.1*
Syrupus ferri iodidi	5.	5.	5.0	0.5**
Spiritus aetheris nitrosi	4.		1.52 to 2.66	
Fluidextractum nucis vomicae: strychnin ..	1.0		1.5	
Tinctura lobeliae	10.0		20.0	
Tinctura iodi	7.0	10.0	2.5†	10.0‡
Unguentum sulphuris	15.0	33.0	10.0	
Vinum colchici	10.0§		20.0¶	
Vinum ipecacuanhae	10.0		5.0	
*Austrian.	‡Fortis.			
**French.	§Seed.			
†Mitis.	¶Corm.			

TABLE 2.—STRENGTH OF PREPARATIONS EXPRESSED AS AMOUNT OF ACTIVE INGREDIENT PER UNIT DOSAGE FORM.

Trochisci santonini	0.01 French 0.03 U. S. 0.06 British
Pulvis effervescens compositus	7.5 German, U. S. and British 10.0 Austrian

TABLE 3.—OFFICIAL LATIN NAMES IN UNITED STATES PHARMACOPEIA AND IN FOREIGN PHARMACOPEIAS.

Liquor calcis	Aqua calcariae—German
Kaolinum	Bolus alba—German, Austrian, etc.
Plumbi carbonas	Cerussa—German.
Cinchona	Cortex chinae—German, Austrian, etc.
Oleum morrhuae	Oleum jecoris aselli—German, etc.
Oleoresina aspidii	Extractum filicis liquidum—British
Ergota	Secale cornutum—German
Nux vomica	Semen strychni—German, etc.
Santonica	Flores cinnae—German, etc.
Cambogia	Gutti—German, etc.
Hexamethylenamina	Hexamina—British
Hydrargyri chloridum mite	Hydrargyrum chloratum—German
Hydrargyrum ammoniatum	Hydrargyrum praecipitatum album—German
Aqua hydrogenii dioxidi	Hydrogenium peroxydatum solutum—German
Potassii chloras	Kalium chloricum—German, etc.
Sodii chloridum	Natrium chloratum—German, etc.
Oleum tiglii	Oleum crotonis—German, etc.
Acetphenetidinum	Phenacetinum—German, etc.
Antipyrina	Phenazonum—British
Benzosulphinidum	Glusidum—British
	Saccharinum—German, Austrian
Potassii bitartras	Tartarus depuratus—German
Potassii et sodii tartras	Tartarus natronatus—German
Antimonii et potassii tartras	Tartarus stibiatus—German

into the pharmacopeial language of that country, but also revised, so as to be correct as regards the strength of the preparations of that pharmacopeia.

3. International use of Latin in medical literature would be an argument of some importance in favor of Latin prescription writing; but, as can readily be shown, the *Latin names of drugs are far from being international*. Examples are given in Table 3.

Any one who reads and understands English well enough to study English literature would surely have no difficulty in understanding a prescription written in English. Should other nations retaliate by using their language instead of Latin, that would hardly require a greater knowledge of the foreign tongue than would be needed for the use of the literature of that language. Should, however, the other nations persist in the use of Latin, the knowledge needed to translate these prescriptions into English would be much more easily acquired than the ability to write Latin prescriptions correctly. In point of fact, however, as one looks over current literature, in various languages, one finds very few Latin prescriptions. Generally, whenever medicines are mentioned, in German, French or English literature,

ILLUSTRATIVE PRESCRIPTIONS.

Prescription in Latin.

	gm.	vel	c.c.
Syrupi ipecacuanhae	8		
R Ammonii chloridi	5		
Aquae	q. s.	ad	60

Misce et fiat solutio.
 Signa: Teaspoonful in water every two hours.

Prescription in Latin.

	gm.	vel	c.c.
R Hydrargyri chloridi mitis	2		06
Sacchari lactis	2		

Misce et divide in chartulas x.
 Signa: One every hour.

Prescription in Latin.

	gm.	vel	c.c.
R Morphinae sulphatis	12		
Extracti belladonnae, ana	24		
Olei theobromatis	24		

Misce et divide in suppositoria xii.
 Signa: One every four hours, as needed.

Prescription in English.

	gm.	or	c.c.
R Ammonium chloride	5		
Syrup of ipecac	8		
Water	to make	60	0

Mix and make solution.
 Label: Teaspoonful in water every two hours.

Prescription in English.

	gm.	or	c.c.
R Mild mercurous chloride	2		06
Sugar of milk	2		

Mix and divide into ten powders.
 Label: One every hour.

Prescription in English.

	gm.	or	c.c.
R Morphine sulphate	12		
Ext. of belladonna, each	24		
Oil of theobroma	24		

Mix and divide into twelve suppositories.
 Label: One every four hours, as needed.

dosage and method of administration are discussed in the language in which the article is written and not in Latin.

4. Inasmuch as it is the popular opinion that doctors use Latin in prescription writing to keep the laity in ignorance for selfish ends, it seems high time that we antagonize this idea; and we can do this most emphatically by using English. This we can also do with perfect safety, for *secrecy is very rarely, if ever, essential* in the practice of the up-to-date physician, who generally prefers to take his patient into his confidence than to keep him in ignorance. Deception is not practiced by the true physician. Therein lies the special difference between the quack and the honest medical man. Furthermore, Latin prescription writing does not really contribute much more to secrecy than the use of English, for the *Latin and English official terms for drugs and preparations are often identical, generally very similar to each other*. So similar are they, that certain books on prescription writing advocate the use of synonyms, as *pulvis Doveri*, *liquor Fowleri*, etc., when it is undesirable in the patient's own interest for him to become acquainted with the treatment. When it is stated

that self-medication might be encouraged by the use of English, I fail to see the force of the argument. Is the patient more likely to call for sodium bromid at the drug store when it is written "sod. brom.," standing for sodium bromid, than when it is intended to read "sodii bromidi"?

That, with few exceptions, the use of English gives the patient no more and no less information than the use of Latin, may be seen from the accompanying illustrative prescriptions.

In respect to the fifth reason, all that seems to be necessary is to call attention to the fact that the time allotted to the teaching of pharmacology and therapeutics is extremely limited, actually insufficient to teach the essentials. Is it not reasonable to suppose that a conscientious teacher, freed of the necessity of burdening his course with the teaching of Latin forms, would have more time for the more important facts in connection with prescribing? Surely, making a subject more complicated does not lead to a better mastery of it.

It has been my experience that the teaching of Latin prescription writing makes it difficult to get into the students' minds the really important facts about prescribing, namely, the "art of prescribing," or more specifically, the "technic of medication," which has nothing to do with the language used. This is a matter that is not sufficiently studied by medical students or practitioners; and it is not improbable that focusing attention on the mere language of the prescription causes the really important question relating to the most efficient and most pleasant administration of the remedy frequently to be lost sight of.

It is true that students now come to us with better preliminary training than was formerly the case; it is also true, however, that even a professor of classical Latin would have to learn our prescription "Latin" almost as if he had not studied Latin before, for the Latin of prescriptions consists essentially of Latinized modern terms. One can find but few of them in a dictionary of classical Latin.

That the teaching of Latin prescription writing has so far contributed but little toward the preservation of good form will be admitted by any one who has had experience behind the prescription counter. An investigation[§] which I conducted on the quality of prescription writing in this country, to which 100 leading pharmacists in various sections of this country contributed and which represented an examination of 10,000 prescriptions, showed that less than one-half of all prescriptions are written in correct Latin form, 36 per cent. of all prescriptions being written in English and 18 per cent. in poor Latin. If there is any error in this compilation—and it must be admitted that modern pharmacists generally have merely a knowledge of

[§]Fantus, Bernard: What Instruction Ought Medical Colleges to Give in Pharmacology and Therapeutics, Part B of Symposium, The Viewpoint of the Pharmacist, Quart. Fed. State Med. Boards of U. S., 1914, p. 293.

what might be called "prescription Latin," it is likely to be in the way of overlooking minor errors in Latin; so that probably much less than half of all prescriptions are written in correct Latin form—surely a poor showing for the time and energy invested in teaching Latin prescription writing.

Even the Latin prescriptions published in current medical literature, in periodicals as well as in text-books, including those published in some books on prescription writing, contain enough errors to make their authors blush were they pointed out to them. Would it not be better to have prescriptions written in correct English than to have them written in the slipshod and at times ridiculous way in which so many of them are written at present?

While, therefore, none of the arguments in favor of Latin prescription writing can be said to be irrefutable, a number of arguments in favor of English prescription writing deserve consideration.

1. The Roman numerals, especially I and L (standing for 1 and 50) are apt to be mistaken for each other, while our common numerals are much more distinct from each other in appearance (E. G. Eberle).

2. Few of us are sufficiently versed in Latin to be able to express directions to the pharmacist that are in any way unusual. Even if we were capable of writing such directions in Latin, not one druggist in a hundred would be able to understand them. Unusual directions to the pharmacist are, therefore, generally written in English, even in Latin prescriptions, which, though endorsed in the committee report quoted above, is really less correct than using either language throughout.

3. New drugs are continually being introduced, the coining of the Latin names for which is an embarrassment to the prescriber.

4. It is probable that the fear of making mistakes in the Latin form is one of the contributing causes to that therapeutic abomination, the prescribing of ready-made official or proprietary mixtures. *Latin prescription writing absolutely stifles originality in prescribing.*

5. After all, the whole proposition of writing prescriptions in Latin is a pretense at a knowledge of Latin, of which most of us possess so little that we would be unwilling to have our ability tested by one who is a recognized authority in that language. Encouraging students to think that it is a creditable thing to shine in a veneer of knowledge as superficial as that of Latin usually is cannot but have a detrimental effect on the inculcation of the principle of thoroughness that should guide all good teaching.

6. By far the most important reason for writing prescriptions in English lies in the difficulty medical students have in learning the Latin form. To the student, prescription writing is a bugbear. When one thinks of the crowded medical curriculum and the comparatively small number of hours set aside for pharmacology and

therapeutics, it seems a pity to waste any of it on the acquiring of an antiquated form of expression.

It appears that the real reason for prescription writing in Latin is historic. It originated in the days when Latin was the chief medium for exchange of scientific thought. No longer, however, are scientific lectures delivered in the Latin tongue, no longer are medical books written in Latin, no longer is it considered essential for an educated man to speak Latin; and yet we still feel bound to write prescriptions in that dead language. Is it not time to relieve our medical students of this useless burden that is put on them to the detriment of something else that would be much more useful to them and to their patients? *Let us at least admit that a prescription correctly written in official English is as good as one written in Latin.* Let us permit students and practitioners to use whatever form they prefer, and let us merely hold our students for a sufficient knowledge of the Latin form to enable them to translate and understand such prescriptions.

A DIGEST OF REPLIES TO QUESTIONNAIRE ON PRESCRIPTION WRITING IN ENGLISH.

A preliminary draft of this article was sent to leading medical teachers, to deans of schools of pharmacy, and to secretaries of State Boards of Health. For the numerous replies obtained in return, and most especially for a number of suggestions received from some of those in favor as well as some of those opposed to the proposition, I wish to express my sincere thanks. An analysis of the reports gives the following results:

Of sixteen deans of colleges of pharmacy who responded, ten were in favor of the proposition, four were opposed, and two were neutral.

Among ninety-two medical teachers, who responded, sixty-seven were in favor, twenty-two opposed, and three neutral.

In two institutions, the question of prescription writing in English was taken up in faculty meeting. The faculty of the School of Medicine of Yale University voted, Jan. 24, 1916, that "it was the sense of the faculty that English be the language of choice in instruction in prescription writing." The faculty of the University of Michigan, on the other hand, passed a resolution, Jan. 25, 1916, opposing the writing of prescriptions in English. In its opinion, more time, instead of less, should be given to Latin.

An interesting reply was received from Prof. Gabriel Casuso, president of the University of Havana, Cuba, from which I quote: "I believe you are right in every respect—among us, the laws governing the matter, although they do not restrain the use of Latin, allow the employ of the vernacular tongue, and the pharmacists are not obliged to dispense prescriptions unless they are written in plain Spanish."

To secretaries of State Boards of Health, the question was sent, "Would your examining board give a candidate a low grade, should

he, in an examination, write a prescription in correct English instead of writing it in Latin”?

In reply to this, the following State Boards expressed, through their secretaries, presidents or examining officers, their willingness to accept prescriptions written in English at the same value as those written in Latin: Alaska, Arkansas, California, Connecticut, Florida, Louisiana, Montana, Minnesota, Massachusetts, New Mexico, Ohio, Rhode Island, Virginia, Vermont, Wisconsin and West Virginia.

The following State Boards have declared their objection to prescription writing in English: Illinois, Iowa and New Jersey. This makes a total of sixteen in favor, and three opposed.

From this it will be seen that the sentiment in favor of English prescription writing is surprisingly general.

The Preparation of Abutments and Construction of Pinlay and Pinledge Attachments for Bridgework.*

JAS. KENDALL BURGESS, D.D.S., NEW YORK CITY.

THE subject of my clinic is “The Preparation of Abutments and Construction of Pinlay and Pinledge Attachments for Bridgework.” The case before us is one in which the upper right first bicuspid has been lost, and we have elected to use the second bicuspid and the cuspid for the abutments. Such a case enables us to make both posterior and anterior attachments in one mouth and so condense our work. My clinic is on the attachments merely, and not on bridgework, so I shall not deem it necessary to go into a discussion of other details, as, for instance, why we do not content ourselves with the use of one attachment and construct a cantilever bridge for so simple a case. You will observe a fairly large compound amalgam filling in the morsal and distal surfaces. This gives me the opportunity to bring out a point which I am very glad to make. Dr. Hughes, who secured the case for me, discovered the cavity and informed me of it, asking my desire with reference to it. I asked that it be filled, care being taken to see that the filling was well anchored. Where teeth are well filled with material of a permanent nature, I handle them as nearly as possible as if they were normal, preparing my cavities and obtaining my anchorage into the filling material, where it comes into the field of operation much the same as if it were tooth tissue. It will be observed also that both teeth are vital. One very strong claim that I make for these attachments is that their use rarely necessitates the destruction of the pulp. Where that organ is found in pathological condition its removal

*Clinic given before the annual convention of the Virginia State Dental Society, Richmond, Va.

is necessitated, whatever be the operation to follow, but where a physiological condition obtains I believe it to be decidedly bad surgery to remove it. I am perfectly familiar with the arguments in favor of such a procedure as a preventive measure, but I do not concede their correctness, and my contention is borne out by my own experience and that of many other operators. But I must not forget that I am giving a clinic and not reading a paper. If there be those who believe in pulp extirpation as a preliminary to bridge placement, the pinlay and the pinledge lend themselves perfectly to that method of procedure.

We begin our operation with a saucer-shaped vulcarbo, disk mounted, with the convex side toward the hand-piece, and kept thoroughly wet by the use of a small syringe in the left hand. We slice away a small portion of the mesial surface of the bicuspid, including the mesio-morsal and the mesio-lingual angles, but holding the disk at such an angle as that the mesio-buccal angle is left undisturbed. The resulting flat surface we call the proximal plane—the cervical margin of which I make no attempt to carry below the gum. I cannot recall having seen the occurrence of decay at one of these margins. Veering this plane slightly toward the lingual surface serves the double purpose of bringing it more completely into the field of the soldering operation, and keeping the metal out of view on the buccal surface in the finished work. We now take a flat vulcarbo disk about the size of a dime and cut a groove in the centre of the morsal surface from the morso-mesial angle posteriorly about two-thirds of the way towards the morso-distal angle, and in depth slightly below the level of the enamel. We follow in the same groove with a number 44 cavity stone† and, by pushing and drawing, widen the mouth of the cavity where it leads into the proximal plane sufficiently to give the proper strength of union between the inlay and contour parts of the attachment. We follow this with a number 70 cavity stone—an inverted cone (a worn one serving the purpose well)—and extend the cavity in the morsal surface toward the morso-disto-lingual and morso-disto-buccal corners, leaving ample thickness of wall for strength. Beginning now about the centre of the bucco-lingual aspect of the proximal plane, and from 1-16 to 3-32 of an inch below the floor of the cavity, we cut a vertical groove about 1-16 of an inch deep mesio-distally, leading into the floor of the cavity. The cavity is now roughly formed, and we proceed to finish it with a number 29 or 30 cylindrical cavity stone, paralleling and smoothing the walls, flattening the floor of the cavity and sharpening the angles of their union. Also finishing the groove in the proximal plane—the proximal groove—and flattening its floor—the proximal shoulder—and sharpening the angle of union of wall and floor. We come now to the

†All numbers of cavity stones refer to the Miller stones—not necessarily by way of recommendation, but as descriptive of approximate sizes and shapes.

cuspid, and with the same large vulcarbo disk we flatten somewhat the disto-lingual angle, taking care not to mar the labial enamel plate. Now with a number 43 ready mounted stone, with its base at right angles to the long axis of the tooth, we cut a notch, to about the depth of the enamel, across the lingual surface just short of the cervical shoulder—the cervical notch—and another half-way between this and the incisal end—the incisal notch. Next, with a number 29 cavity stone held at approximately the same angle and placed in the centre of the cervical notch, bearing labially, we cut the cervical groove to a depth of about two-thirds of the diameter of the stone. We then cut two similar grooves, the mesio-incisal and the disto-incisal in the incisal notch—beginning near the mesio-lingual and disto-lingual angles respectively, and bearing labially or slightly toward the pulp. The floors or ledges of these grooves should be flat and the angles at which they join the sides very sharp. The stone work is now complete and we are ready for the pin openings. I make it an almost invariable rule not to drill any of the pin openings until the stone work in all abutments is complete. By this method it is easier to make all pin openings parallel, and it should be said here that the pin openings, grooves and cavity sides of all abutments should be as nearly as possible parallel. For these openings I prefer a drill to a bur, and since I have not been able to find the proper size I make them myself from a number $\frac{1}{2}$ revelation bur. We shall make three openings in the bicuspid—one just inside the enamel wall near the disto-lingual angle of the cavity—a corresponding one near the disto-buccal angle, and one about the centre of the proximal shoulder. We shall also make three in the cuspid—one about the centre of each ledge. They should be about 1-16 to 3-32 of an inch in depth. If we have made our drill correctly, these openings should take a 24-gauge wire comfortably. If the wire binds we may ease it by carrying a $\frac{1}{2}$ revelation bur into each of the openings.

The preparation being complete, we proceed to the work of construction. First, we prepare as many pins as we shall need. They are made of 24-gauge iridio-platinum wire. After filing away the bur edge we bend the wire at right angle and cut off just beyond the elbow, making a pin slightly longer than the depth of the pin opening. A little practice will enable the operator to make these pins with sufficient accuracy without taking measurements. Now, to the matrix, which is made of ordinary inlay gold, 1-1000 or 2-1000 of an inch in thickness. We cut a piece $\frac{1}{2}$ or $\frac{3}{8}$ of an inch square and place in such a position as that when carried to place it will cover all margins. With a ball of bibulous paper in the operating piers we begin pressure, not in the body of the cavity, but at the mesio-mesial angle and in the direction of the pulp. We follow this with pressure in the cavity and in the proximal groove until the matrix is fairly well in position and the margins well defined. We remove

and trim away the surplus, leaving a narrow margin around the cavity part, but cutting fairly close to the margin of the proximal plane. We anneal, replace and continue pressure with roll or several layers of bibulous paper under fairly sharp edge burnisher or pincer beaks, carrying the gold well into sharp angle formed by floor and sides of cavity. The matrix should now lie dead to position. With a pointed instrument we puncture into the pin openings and place the pins into them, handling them by the elbow with the operating pliers. Having prepared small pieces of adhesive wax§ and using a fine pointed instrument, we place a piece at the union of each pin with the matrix and melt around the pin with a warmed blade burnisher. In the same manner we flow a thin layer of adhesive wax over the proximal plane of the metal, being careful not to allow it to overrun the margin and come into contact with the tooth. We mash a small piece of inlay wax between the thumb and finger and press to position on the proximal plane to form the contour. We now flow a small quantity of adhesive wax in the manner previously described into the cavity and against this contour to secure it. Then we complete the filling in with bits of inlay wax and a hot burnisher—shape the contour—finish to the margins, carve and adjust the occlusion and smooth the whole preparatory to removing. We now cool thoroughly with plater, place a small instrument in the morsal surface and one in the contour, and tease the pinlay out of the cavity. It is now ready for casting.

Exactly the same methods are pursued in the construction of the pinledge for the cuspid up to the point of securing the pins in position. Following this we flow sufficient adhesive wax to stiffen the metal and hold it in position—burnish all margins accurately to position—cool and remove. It is now ready to be invested and finished by sweating 22k. solder over its surface.

§Recipe for adhesive wax: Melt together 3½ oz. white wax, 1½ oz. gum dammar, and add ½ oz. resin. Allow debris to settle and pour into shallow metal box.

CALCIUM LACTATE AS A SAFEGUARD AGAINST HEMORRHAGE.—It is not uncommon that cases present for extractions who give a previous history of severe and long-continued hemorrhage. One of the simplest and safest drugs for controlling this idiosyncrasy is calcium lactate. A dose of 5 gr. three times a day, for several days before the operation, generally ensures an absence of trouble in this direction. The drug can be obtained in tabloid form, and can be continued subsequent to the operation, if any doubt still exists as to the possibility of secondary hemorrhage.—*Australian Journal of Dentistry*.

The Ontario Oral Hygiene Committee.

THE executive of the Oral Hygiene Committee of the Ontario Dental Society held its 54th meeting on Thursday, June 8, at the Crescent Inn, 473 Spadina Ave., Toronto, at 6.15 o'clock.

Members present were Doctors McLaughlin, Eaton, Seccombe, Coyne and Reade.

The minutes of the last meeting were read and confirmed.

The members of the executive, elected by the Ontario Dental Society for the year 1916-17, are: Doctors R. G. McLaughlin, H. E. Eaton, R. J. Reade, N. S. Coyne and A. W. Ellis, and ex-officio, Doctors Wallace Seccombe, J. A. Bothwell and W. Cecil Trotter.

The first business of the evening was the election of officers for the ensuing year. Dr. R. J. Reade being elected chairman; Dr. H. E. Eaton, vice-chairman; Dr. N. S. Coyne, secretary, and Dr. A. W. Ellis, treasurer.

The committee thought that the main feature of the work for the ensuing year should be to interest the rural districts to undertake the work of oral hygiene. With this aim in view the secretary was requested to get the names of the various conventions held in the different parts of Ontario this fall with their dates.

The committee thought it would be a great benefit to those undertaking the responsibility of addressing the teachers' conventions if they had outlines of the various methods in which the subject should be presented. Dr. Wallace Seccombe was requested to draw up such outlines with the purpose of having the same printed by the committee and sent to the different men undertaking this work, so that there might be some uniformity in the presentation of the subject.

Dr. McLaughlin reported that Mr. Putnam would like to have our paper for publication. The chairman and vice-chairman were appointed a committee to look after the matter.

An account from Mr. M. S. Weir, for the printing of the annual reports and envelopes, amounting to \$31.00, was passed and ordered to be paid.

The meeting adjourned at 9.30 p.m.

R. J. READE, Secretary.

Obituary—Mrs. J. A. Bothwell.

THE dental profession will learn with deep regret of the death of the wife of Dr. J. A. Bothwell, of Toronto. Dr. Bothwell may feel assured of the sincere sympathy of his dental friends and confreres in his loss.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

Honor Roll

MAJOR P. P. BELLACHEY, 58th Batt.

MAJOR C. E. SALE, 18th Batt., 4th Brigade.

LIEUT. H. J. McLAURIN, 43rd Batt.

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Lieut. H. P. Travers.
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†Acting Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—Care Director Dental Services, Canadian Contingents, 23 Earls Ave., Folkestone, England.

of CANADIAN DENTISTS

ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

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Major F. T. Coghlan, 25th Battery.	Capt. Walter McNally, 179th Batt.
Major Chas. A. Corrigan, Army Service Corps.	Capt. S. J. Redpath, 47th Batt.
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Concentration Camps

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Lieut.-Col. Neil Smith, 181st Batt.	Lieut. A. J. Kennedy, 114th Batt.
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Major N. Schnarr, 94th Batt.	Lieut. T. H. Renton, 146th Batt.

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H. Greenwood, 76th Batt.	H. G. Reid, Mechanical Transport.
G. E. Harper, C.F.B.	W. E. Sheridan, 67th Battery.
G. M. Heisz, Div. Sig. Corps.	G. A. Sirrs, Army Transport.
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G. W. Howson, 126th Batt.	W. H. Smith, 160th Batt.
T. H. Hutchinson, C.A.D.C.	W. L. Smith, Div. Sig. Corps.
J. T. Irwin, 4th U. Co.	V. D. Speer, 67th Battery.
G. G. Jewitt, Field Amb.	C. W. Steele, 67th Battery.
A. N. Laidlaw, Mach. Gun.	F. L. Thompson, C.A.D.C.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

DIABETES FROM THE STANDPOINT OF THE DENTIST.

MORE is expected of dentists to-day than formerly. Dentistry has attained a place as a distinct profession, having its own departments of specialization. Some one, with a keen sense for the humorous, has divided dentistry into two sections, "Septic and Preventive." However much we may dislike the former appellation, we certainly must agree as to the correctness of the latter. Preventive dentistry looms large on the horizon. As a result of modern methods of dental treatment it is fair to assume that more time will be devoted to the maintenance of a healthy condition of the oral cavity than to operative measures having for their object the restoration of lost tissues.

With this in view we place emphasis upon preventive dentistry in our curriculum of studies. Our medical confreres, whose sympathy and co-operation we so much appreciate, force us to go a step further. They ask us to co-operate with them in preventing the progress of ailments, not particularly dental in character, which early become manifest in the mouth. In effect, we are not only to practise preventive dentistry, but also to aid in that much larger field of preventive medicine. The claim is not made that it is the office of the dentist to treat these ailments, but rather that he recognize their serious import and refer the patient to a physician for early treatment. If such a course be followed the dentist becomes an important factor in that all-important sphere of preventive medicine.

As a concrete example illustrating this view let us refer to the very excellent paper published by H. H. Schuhmann, M.D., D.D.S., in *Dental Review* (May), "Diabetes From the Standpoint of the Dentist." The following statement, made by the author in the opening paragraph of his paper is, in effect, a recapitulation of his views regarding the dentist and his responsibilities in preventing the spread of disease: "The dentist may or should be able to recognize incipient diabetes, and by being so observant may render his patient inval-

able service at a time when the symptoms have not as yet become sufficiently alarming to invite the physician's attention unless he is informed of the patient's condition as a result of the dentist's keen observation." Dr. Schuhmann points out that the usual diagnostic sign of diabetes is found in the analysis of the urine, and is due to the fact that the patient has lost either in part or entirely the ability to utilize or to assimilate carbo-hydrates. A symptom of diagnostic value is the falling off in weight with the continuance of an abnormally large appetite. There is also the voiding of large quantities of urine.

There are other symptoms, however, shown in the oral cavity, and these hold particular interest for the dentist. In the early stages of diabetes there is frequently found "a very marked feeling of dryness in the mouth, throat, and also of the tongue. A stomatitis and general reddening of the oral mucous membranes is a noteworthy oral manifestation which is looked upon with suspicion." The author suggests that this condition is accounted for by the great lack of moisture in the mouth. Where a patient has been using a denture for some time without suffering any discomfort and suddenly finds some spots occurring on the tissues under the denture which show no tendency to disappear after easing the offending areas, "such cases should at once arouse suspicion." In diabetic subjects the appearance of the tongue is characteristic. It is found "to be enlarged with the edges indented and marked by the pressure of the teeth. At times the surface of the tongue is found heavily coated, accompanied with these indentations, and further is apt to show deep fissures and cracks, which are painful and very intractable to all efforts we may make to cause them to heal. Again, we find enlarged and inflamed papillae on the tongue and mildly shining, smooth blue-red colored blotches, such as are frequently found in Leukoplakia."

That there may be some difficulty in diagnosis between pyorrhoea alveolaris and diabetes is evident when we review the symptoms of this latter disease about the gingivitis or in what is most commonly termed "gingivitis chronica diabetica." Dr. Schuhmann describes this condition as follows: "The gingival, and particularly the interdental gingival margins, show dark red edges, bleed easily, and are painful. The whole gum tissue at the same time is swollen and tumified. A further development of this tissue change will be noticed either in the necrotic breaking down of the gum margins or their retraction, laying bare large surfaces of the tooth neck and possibly the alveolus. Prof. Grunert also describes whitish patches on the mucous membrane, which if irritated by the brushing of the teeth will break down into small pustules that are very painful, patients complaining of severe burning pains."

The author is of the opinion that whenever pus pockets are found with rows of loose, sensitive teeth, especially where the condition has

appeared suddenly, a urine analysis should be made with a view to demonstrating diabetic conditions. Baum and Gille are quoted as holding like opinions in this regard. If these loose teeth of diabetic subjects be extracted and examined, the roots will show a peculiar formation—"resorptions in the shape of large deep notches and, according to Gruenert, at times almost needlelike pointed root ends, which are, as a rule, of a brownish transparent color almost like amber." It is not claimed that these symptoms occur in all diabetic cases, but that they are so frequently seen as to be taken as a warning.

Where the teeth loosen as the result of diabetic condition, they are found to return quickly to a healthy condition, provided the sugar indications temporarily disappear or are diminished. The pulps of these teeth remain alive, and the pain does not subside even after the pulps have been removed or the teeth extracted. In this particular diabetes differs from pyorrhoea.

Some of the leading investigators on this subject are quoted as finding a very noticeable susceptibility to dental caries in diabetic patients. The author describes a typical case—"A man of seventy-eight years of age who ultimately died of diabetes. His teeth decayed very, very rapidly, beginning with the posterior ones and gradually attacking others situated further forward, the crowns decaying in such a manner that nothing but rugged stumps were left. This patient would lose almost an entire crown in a month's time from decay. I found the bottom of such cavities filled with a marked leathery yellow-brown decay, which could be lifted almost clean from the underlying, slightly softened denture."

There are some points of difference in the character of the decay in the cases of diabetic and non-diabetic patients. In diabetic cases "the decay would start on the necks of the teeth by exhibiting a peculiar shaped brownish or yellow spot, which could be easily overlooked entirely by a casual observer, but which rapidly progressed to actual decay around the whole circumference of the neck of the tooth entirely devoid of pain or of any sensitiveness, so thoroughly different from decay of that kind when of non-diabetic nature. The shape of these cavities in the beginning is a cut as if produced by a saw. The groove rapidly spreads towards the crown and more slowly towards the root end. The enamel does not seem to join in the process so much and is many times left like a hollow shell."

It has been suggested that gutta-percha be used as a filling material in the treatment of cavities of diabetic patients, many holding to the opinion that the mercury contents of amalgam have a disastrous effect upon the gingival. Any contemplated bridgework should be abandoned, tartar should be scrupulously kept off the teeth and the pockets washed out frequently with one-half per cent. solution of lysol and peroxide of hydrogen. "Iodine mixtures, especially if mixed with chloride of zinc and glycerine, are very advantageous."

Loose teeth should be ligated and retained, as they may become useful again as soon as healthy systemic conditions are restored. Extraction, if at all possible, ought to be avoided. If, however, this must be done, extra precautions ought to be observed. "Thorough asepsis is a first and last positive requirement." Considerable difficulty may be experienced in allaying pain after extraction and also in getting the sockets to heal.

It will be seen from the foregoing imperfect review of Dr. Schuhmann's paper that it is possible for a dentist to be of real service by early recognizing the symptoms of diabetes as shown in the mouth. The sickening, sweet breath odor, the rapid advance and peculiar character of dental caries, the sudden loosening of the teeth, the change in character of the gingival, persistent irritating areas under dentures—all these are indications of a condition that demands attention. Skill in diagnosis by the dentist will not only benefit the patient, but will also aid the dentist in selecting the most suitable remedial measures in his work.

GENERAL ANESTHESIA WHEN MAKING DENTAL RESTORATIONS.

General anesthesia in dental operations, such as cavity preparations, has not attained the degree of importance that its earliest advocates claimed for it. Undoubtedly it has its place in general practice, yet its use is not unattended with danger.

For instance, it is generally recognized that one of the common causes of pulpal hyperemia is due to shock—the result of overheating the tooth. The usual remedy adopted to avoid this, such as directing a spray of water or air upon the tooth during the operation, is difficultly applicable when the patient has been given, say, nitrous oxide, because of the necessity for rapid work. Dr. Elmer S. Best, in *Dental Review* (May) speaks of this in part as follows: "I have come rather frequently in contact with three conditions due to the use of this agent. Too extensive cutting has caused an exposure of the pulp. Too rapid cutting also causes an overheating of the tooth, or sometimes several teeth, thus hyperemia is set up. Lastly, a rather amusing condition. Owing to the inability of the patient to feel pain, and the hurry in which the cavities were prepared, I have observed crowns and inlays placed on non-vital teeth with large infected peri-apical areas, in the assumption that they were vital teeth."

Modern dental science has done much towards lessening the many difficulties attendant upon dental operations, yet that time is still distant when great care and laborious technique will not be requisite for satisfactory dentistry. We would be acting wisely, therefore, in not attempting to make too general an application of any new dental method, however efficient it may prove for a restricted and particular purpose, until the extent of its usefulness has been fully demonstrated.

RADIUM EMANATION IN THE TREATMENT OF PYORRHOEA
ALVEOLARIS.

Those interested in the study of radium have been, of late, surfeited with literature dealing with this intensely interesting subject. Scientific and other journals have told about all that is known of this new wonder. Yet, for the layman, much that has been written holds little interest. He has been compelled to stand, as it were, a spectator hearing much, but understanding little, of the controversy.

Dr. Frank Marshall, in the *Commonwealth Dental Review* (March) deals with the question of radium emanation, and in a spirit of splendid generosity treats this subject in a manner so simple as to receive the commendation of those who wish to understand the fundamentals without being encumbered with elaborate scientific data. Dr. Marshall points out that "the germs of the whole modern theory of the electrical nature of matter, of the transformation of matter, of atomic disintegration are found in the discoveries of the Cathode rays, the X-Rays, and the emissions from spontaneously radio-active substances, such as uranium, thorium, radium, etc.

Taking radium as an example, the author explains the terms Alpha, Beta and Gamma rays. "The Alpha rays are numerous and are positive ions—bodies charged with positive electricity; their velocity is about 20,000 miles a second, but they have very little penetrative power—a sheet of paper will stop them. The Beta rays are fewer than the Alpha rays, and are negative electrons—bodies charged with negative electricity. Their velocity is more than 100,000 miles a second, approaching the velocity of light. They are considerably penetrating, passing straight through many bodies considered opaque "with sublime indifference to the properties of the bodies, excepting that of density." The Gamma rays are more mysterious and therefore difficult to define. There are few of them and they appear to be neutral electrically. Their penetrative power is enormous, being able to pass through a foot of iron and through several inches of lead."

Having disposed of these terms, the author makes clear the meaning of radium emanation and shows for what useful purposes it may be used. It is pointed out that radium is in a continuous state of atomic activity, or rather atomic disintegration. "Its first transformation product is a heavy radio-active gas called 'Radium Emanation,' the life of which is about $5\frac{1}{2}$ days, during which period the emanation in its turn is continuously transformed into other radio-active products, termed the 'Radio-active deposits of rapid change,' viz.: in succession radium A, life about four minutes; radium B, life about thirty-eight minutes; and radium C, life about twenty-eight minutes." Radium emanation is a gas and may be collected and held in solution in water, alcohol, petroleum, or may be absorbed by some solid substances, such as charcoal, meerschaum, etc.

Now come some interesting facts regarding radium emanation. "Being a heavy gas it diffuses very slowly from the liquid holding it in solution. It can be liberated from the liquid by vigorously shaking the latter or boiling it. The emanation of radium gives three times as much energy as the radium from which it is derived, although the actual amount of matter in the emanation is itself practically imperceptible. A third fact to be well borne in mind is the phenomenon called 'induced radio-activity,' which consists in all substances in close proximity to the emanation, becoming radio-active, this artificially provoked activity, due to the absorption of the emanation's active deposits being very tenacious. If, for example, a metallic wire is exposed to the emanation, and then treated with sulphuric acid, and the residuum then evaporated and collected, this latter will be found to be still radio-active. It is with this 'induced-radio-activity' as a fundamental fact that explanations have recently been made of the physiological effects of internal administrations of radio-emanation."

Reverting to the problem of pyorrhoea. The author finds that the prevailing methods of treatment are as follows: (a) Remove all irritants, both local and constitutional, (b) place the eliminating organs in a healthy condition, (c) stimulate the tissues to healthy action. This method of treatment involves, primarily, the restoration of a healthy body condition, in addition to local treatment. "I am of the opinion," says Dr. Marshall, "that a great many cases of pyorrhoea recur for other reasons than those caused by local irritation. A great many of these cases are due to faulty metabolism. Irritation and inflammation in many cases are the characteristics of oral lesions, and are, in the main, reflexes and local manifestations of general systemic disturbances."

Now to establish the relation between radium emanation and its possible use in curing pyorrhea. Recognizing that faulty metabolism is, in a measure at least, a causative factor in the condition of pyorrhoea, and knowing the efficacy of radium emanation in correcting such conditions, there is reason to hope that by means of this agency we may be able to effect an improvement in the condition or perchance establish a positive cure.

There is some clinical evidence to encourage this belief. Professor Traurer, director of the Dental Institute of the University of Graz, reports the results of his efforts with radium emanation water, administered both locally and internally. "By this simple treatment I have got surprisingly good results. The pyorrhoea and subjective troubles either disappear altogether or linger with diminished severity, only in the parts where there is accumulation of tartar. After the careful removal of the tartar, the certain disappearance of the pyorrhoea is secured. The pockets close, and the gums adhere again to the teeth. All the loose teeth become fixed."

The local treatment of pyorrhoea by radium emanation consists in the removal of tartar, syringing out the pockets with radio-active water, applying cotton-wool soaked with the water to the areas of the inflammation about the teeth, and using the radio-active water as a mouth wash. When using this water as a mouth wash it is to be forced vigorously about the teeth for at least twenty minutes. This agitation has the effect of liberating the active properties of the water.

Internal administration of radium emanation water is said to have a beneficial effect. Such treatment consists in drinking from ten to thirty ounces of the water daily, according to the radio-active strength of the water.

THE STATUS OF THE DENTIST.

Dr. J. L. Helmer, in *Dental Review* (June) analyzes the status of the dentist and finds that all is not satisfactory. Among other things brought to light by this investigator is the fact that "the vision in the eyes of the public is dim when looking at the profession of dentistry. They see but faintly the outline of a scientist, for to them dentistry is restricted to the teeth alone." The author views with regret the fact that although we are termed "doctors of dental surgery," yet the public demands the services of a medical doctor in cases of fractured jaw or similar operations. He reasons that it is on account of our "lack of proper education" that "dentistry is not honored to a higher level." The following pertinent questions are asked: "Are dentists proficiently prepared? Do they know the human organism sufficiently or the possibility of certain drugs used in general medicine? Are they prepared to recognize symptomatic disease as readily as they should?"

The public, the author finds, does not give consent to the claim that dentistry is a branch of medical science, but considers us, "as do many others of our medical brothers, nothing other than mere mechanicians." In order to improve this unfavorable position in the public esteem, Dr. Helmer would have all dentists qualify as medical doctors in addition to obtaining a training as dental surgeons. He hopes by this means to gain for dentistry due recognition. Such a measure would entail a prolonged course of study and might not be attractive to a sufficiently large number of students. The author recognizes this, and suggests that in order to overcome any possible shortage, that dental nurses be trained to do certain of the work now done by dentists.

All are agreed, no doubt, that the status of the dentist must be improved, yet it is doubtful if there is unanimity of opinion regarding the methods to be adopted for doing this. A multiplication of subjects for study will not make better students or more efficient graduates. More time spent in teaching the essential subjects so as to

insure that the student understands them thoroughly and has a practical working knowledge of same, would seem to be the wiser course. The public respects and recognizes those who are "masters of the situation" in any sphere whatsoever.

Conductive Anaesthesia.

R. D. JARVIS, D.D.S., LONDON.

OF all the present methods at our command, which can be used to make the operations on the teeth and jaws painless, conductive anæsthesia appeals to me the most powerfully. The painless performance of all dental operations has always been a sort of hobby of mine, and now, after having used this method of nerve-blocking continuously for eighteen months, I cannot say too much in praise of it. It is particularly applicable to the mandible, yet the mandibular injection is the most difficult to make. However, when properly executed, the results are wonderful.

INSTRUMENTARIUM.

The instrumentarium consists of a really good hypodermic syringe, such as the Fischer, with steel needles $1\frac{3}{8}$ inches in length. Either Anocain or Novocain Suprarenin Tablets E can be used; two tablets of either, dissolved in 2 C.C. of what is known as the Ringer Medium, will give a 2 per cent. solution. The dissolving medium is prepared by placing 10 of the Ringer Tablets in 100 C.C. of distilled water contained in a special receptacle, the latter then placed in a suitable vessel and boiled. The two syringes which I use are kept in a covered sterilized jar, containing a 3 per cent. Lysol solution.

PREPARATION FOR AN INJECTION.

As much of the Ringer solution as you expect to use is poured in a Novocain dissolving cup, and boiled over the flame of an alcohol lamp; the tablets required are dropped in, not allowing them to come in contact with the fingers, and again boiled; then set aside until your syringe is ready. Removing the latter from the Lysol, it is repeatedly washed out with boiled water and alcohol. By this time your solution has cooled to about body temperature and is drawn into the syringe ready for use.

PREPARATION OF THE MOUTH FOR INJECTION AND EXTRACTION.

Spray the mouth thoroughly with a strong cleansing solution and paint the gums and teeth with Tincture of Iodine, particularly the spot where the needle is to enter must be thoroughly sterilized. If an

upper molar is to be removed, we make what is termed the Zygomatic injection. The needle is inserted into the mucous fold directly over the distal root of the second molar and advanced inward, upward and slightly backward in as close a contact with the bone as possible until the needle is completely buried; the orifice of the latter always pointing towards the bone. Period of waiting before operating, 10 minutes. Anæsthesia, 1 hour.

MANDIBULAR INJECTION.

The needle is inserted about $\frac{1}{2}$ inch above the level of the masticating surfaces of the molars, and at the inner border of the ascending ramus, advancing the needle backward and outward. The syringe is gently moved back and forth while injecting. Period of waiting, 20 minutes. Anæsthesia, 1 to 2 hours.

Before considering the advantages of Conductive Anæsthesia, let me state that this method is not one for a careless operator to adopt. Absolute cleanliness and sterilization is imperative, with a thorough knowledge of the nerve supply. The advantages claimed for Conductive Anæsthesia are (1) Its long duration, (2) The large areas anæsthetized, with but one or two injections, (3) Infiltration of the infected areas can be avoided, (4) The bloodless field of operation and co-operation of the patient, (5) It is a perfectly safe method, (6) It is dependable, the results certain and gratifying.

However, the method is, as stated before, one not to be used by a careless or incompetent operator. Any dentist wishing to become proficient along this line should be personally instructed by an experienced operator. He should also get a skull and study the nerve supply thoroughly.

Advantages of Bacteria.

BACTERIA are so constantly associated with conditions of disease that we are apt to entirely overlook their benevolent activities. Without the aid of these much-maligned micro-organisms, life itself would very soon become extinct.

Nitrifying bacteria take hold of the waste products of animal and vegetable life and convert them into a form suitable for the life of plants. In working the soil, the farmer is simply assisting in the rapid development of germ life by allowing penetration into the ground of heat and moisture. The place bacteria fill in the digestive process is also worthy of note; also the work accomplished in the purification of water, the chemical composition of harmful organic constituents being frequently changed by their action.

Bacteria have even commercial value, being used to stimulate the production of butter and cream.

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TORONTO, JULY, 1916

No. 7

EDITORIAL

A Plea for More Uniform Legislation.

RECENTLY a writer in one of our dental journals made a statement to the effect that the definition of dentistry, as given in the new Dental Act of the State of New York, was unsurpassed by that of any State of the Union.

We have no criticism to make of that opinion, as the definition in question is most complete and concise, and one of which the profession in that progressive state might well be proud. Yet why should it be found necessary for New York to have a different definition of dentistry from that of any other state? The practice of dentistry in one state of the Union or one province of the Dominion is surely the same as any other state or province, and if so, why a different definition?

On matters of dental education there has been constant endeavor to have every state and province measure up to a uniform standard. This effort has been fraught with much good for the dental profession of the United States and Canada.

Why not pursue a similar policy in regard to legislation. Certainly there are matters of minor importance which are peculiar to the

individual province or state, and which can only be dealt with locally; but aside from these there are foundation principles common to all that might well be made the basis for all dental legislation. Such, for example, as definitions—Ethical Standards, the Field of Dentistry and Professional Discipline.

In Canada, matters in this respect might easily be improved. Each province has gone its own way seeking legislation, and as a consequence we have, in the Dominion, nine different Dentistry Acts, each fashioned according to the professional mind of the particular province.

In this young nation of ours this is a matter that might well be taken hold of by the Canadian Dental Association or the Dominion Dental Council. If in such a way the essential features of dental legislation were made Dominion-wide it would surely put the profession upon a stronger and more intelligent basis, and consequently strengthen the hands of the profession in the eyes of local Legislatures.

Do You Love Flowers? Have You a Garden?

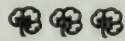
NO more joy-giving or health-producing pastime exists than that of gardening. As a hobby for the busy dental practitioner it is *par excellence*. We want to encourage gardening among dentists and appeal to the flower-lovers of the profession to send us photographs of their garden for publication along with an account of their successes and failures as horticulturists. In the next issue of ORAL HEALTH Dr. Fred Brethour, of Toronto, will discuss and will illustrate the subject by showing a corner or two of his own garden. We will greatly appreciate receiving snap-shots and information concerning *your* garden or photograph of any plant or flowers of which you are particularly proud.

Two Names Added to Honor Roll.

SINCE the last issue of ORAL HEALTH two more Canadian dentists, serving with the Canadian Forces overseas, have paid the supreme sacrifice, having given their lives for the cause of democracy and world freedom. These are Major P. P. Ballachey, of Brantford, Ontario, and Lieut. H. J. McLaurin, of Winnipeg, Manitoba.

ORAL HEALTH will publish elsewhere more detailed information concerning these two war heroes.

Dental Salvation



THE secret of dental salvation may be summed up in three lines :

Give the teeth plenty to do;
Keep them clean ; and
Protect them from infection.





ROSS THOMAS, D. D. S., London, Ontario
President-elect Ontario Dental Society

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, AUGUST, 1916

No. 8

The Value of Oral Hygiene Lectures to the Public and the Responsibility of the Dental Profession in Relation to This Work.*

THADDEUS P. HYATT, D.D.S., NEW YORK CITY.

BEFORE dental colleges were established it was the custom among dentists to keep what knowledge they had acquired to themselves, or to impart it to their pupils only. With the establishment of dental colleges and dental societies, a broader view and a more liberal feeling came into play. Men became willing to share with other members of their profession the discoveries they had made, and as respect and honor were given to them, others strived to obtain honors by study and research work. The gaining of a deeper insight into the anatomy, histology, and physiology of the teeth gave us a realization of the intimate relation existing between the teeth and the body. The advancement made in pathology led us to believe that it might be possible, and even probable, that dental lesions had certain harmful effects upon the constitution, besides those that would come from poorly masticated food. The study of bacteriology, which is still in its infancy, is now adding evidence to prove that diseased mouth conditions bring about systemic disorders.

This increase of knowledge has been, and necessarily must be, slow, while mechanical inventions and operative skill have been extremely rapid, particularly in our own country. The ability of American dentists in saving and keeping the teeth in the mouth is known throughout the world. In spite of the wonderful ability in repairing and saving the teeth, we are confronted by the fact that it is impossible for the dentists of the United States to repair and save

*Read before the Virginia State Dental Society, Richmond, Va., 4th, 5th, 6th November, 1915.

the decayed teeth of all the people. What is to be done? The only answer that can be given is: we must study and teach preventive measures. We all know that if the teeth and the mouth are kept clean, the teeth are less likely to decay. We do not know as yet what factors there are that will produce decay in teeth that are clean; some claim that a clean tooth cannot, and does not, decay; some claim that teeth may decay in the cleanest mouth. Be that as it may, none deny that cleanliness is not only desirable, but it is one of the greatest factors in the prevention of dental lesion. None will deny that the presence of decaying bone tissue in the mouth, being mixed and swallowed with the food, is a detriment to sound and healthy bodies. We also know that reflex nerve irritation can arise, and often does arise, in a decayed tooth affecting nerves and nerve centres, and bring about serious results. The far-reaching influence of reflex nerve action we are only commencing to understand.

For the dental profession to be of the greatest value to the community at large, it is important and absolutely necessary to gain the active co-operation of the people to bring about conditions that will aid in the prevention of dental lesions.

This can be done in three ways:

1. Through the press, magazine articles, and books written in simple and popular style.

2. Through the co-operation of Municipal, State, and Government officials.

3. Through illustrated lectures. Of these, the one having the greatest educational value is the lecture, particularly that which is illustrated. Books, magazine articles and newspapers are of great value, but they have not the personal quality which counts for so much in all educational work.

The speaker is able to pause a moment and explain more in detail here and there just as he receives the "feel" from his audience. He soon learns to be able to tell at once when his audience is not quite certain about some point, and he quickly responds and explains more fully. He can change readily from the argumentative form to the questioning form, to which the answers are perfectly obvious. In this way, and with the aid of clear and simple illustrations, strong and lasting impressions will be made upon the minds of all.

I have written to some of my friends asking their opinion on the value of oral hygiene lectures to the public, and will now read some of the answers:

The responsibilities of the dental profession rest upon the knowledge of the following facts:

1. That reparative work alone cannot cope with the situation.

2. That much of the reparative work is destroyed and rendered useless by the same conditions which brought about the need of reparative work in the first place.

3. That dental lesions not only impair the proper preparation of

food for digestion, but they bring about systemic disturbances which, in many cases, lead to serious illness or even death.

4. That people in general are ignorant of these truths.

5. That people in general do not realize it is within their power to prevent, in large measure, the establishment of these conditions in their own mouths.

6. That dental lesions can be greatly lessened, and in some cases entirely eliminated, by proper care and attention.

7. That preventive measures can be used by all, and that none are too young to learn how to practise them and understand the reasons why they should practise them.

8. That none are better qualified to teach how to do these things, and why to do them, than the members of the dental profession.

In an examination of over 1,000 cases, an average of five cavities to each patient was found. Following along this line of argument, there should be five hundred million cavities in the mouths of the one hundred million population in the United States.

Allowing one-half hour as being the time necessary to prepare and fill one cavity, this would mean it would take two hundred and fifty million hours to attend to this work. If we take out holidays and Sundays, allowing thirty days for vacation and illness, and counting eight hours a day's work, we will find it will take one hundred and twenty-five thousand dentists one year to do this work. There are only forty thousand dentists in the United States.

If one per cent. of this work needed to be done over again, owing to the neglect of the mouth or to other causes, we would be confronted by five hundred thousand cavities, and if any of these involved pulp removal and root filling, the allotment of one-half hour for each cavity would be far too small.

But even if all this tremendous amount of work were done, we still would find that the cause which brought into existence the need of this work had not been removed.

It is practically impossible for every dentist to give to his patients a talk upon the value of mouth hygiene and how to practise it. It requires at least one hour to be able to give, with the aid of illustrations, a comprehensive talk upon this subject so that a person may understand in a logical and intelligent manner the importance of sound teeth and clean mouths, and the systemic changes which are brought about through ignorance or neglect. Merely to tell a patient how to brush his teeth does not answer the need of the present time. People should know, and they have a moral right to know, that many systemic disturbances are brought about by mouth conditions. They should know, and be made to understand, that our profession can do but little without their co-operation and intelligent understanding of the importance of the subject. They should know that the physical growth and the intellectual growth of the child are jeopardized through neglect of mouth conditions.

These are some of the answers I received in reply to my request: "What is the responsibility of the dental profession in relation to the oral hygiene campaign?"

I believe it can be justly claimed by those who started and have worked for the oral hygiene campaign that certain results have already been attained such as the following:

The establishing of Dental Clinics in many of the Public Schools in Europe and in our country.

The recognition by the International School Hygiene Association of the importance of dental attention for school children.

The establishment of an infirmary entirely devoted to the dental welfare of children. I refer, of course, to the Forsyth Institute of Boston.

That one of the largest life insurance companies in America, the Metropolitan Life Insurance Company, have established a dental division for their employees. Here only prophylactic work and examination is being done. The teeth needing reparative work of any kind are marked on a slip and the patient told to go to his dentist to have the work done. You may be interested in hearing the report for the first three months:

We have recently learned that Rochester is to have an infirmary devoted exclusively to the dental welfare of the children.

Realize, as we must, the importance of dental hygiene and what may be done in the way of public education through the press and public lectures, the responsibility of the dental profession is very great. All State and local societies should use every effort to encourage their members to give such talks. As officers of the societies have greater influence than individual members, they should be the ones to visit the State and city officials, particularly those of the Educational Department, and gain their co-operation in carrying on this work.

The New York Department of Education, through its lecture bureau, has for many years given lectures on oral hygiene, and last spring Dr. C. Ward Crampton, the director of physical training of the board, inaugurated a dental hygiene week. I have great pleasure in reading some of the notices sent out by Dr. Crampton to presidents of mothers' clubs, district superintendents, and principals of schools.

The first and second district dental societies of New York State presented banners to the school whose children gave the best tooth-brush drill. These drills were held in Central Park and in Prospect Park.

At Bridgeport, Connecticut, Dr. A. C. Fones and his co-workers have started prophylactic work in the Public Schools, and their first report is of great interest. Six thousand seven hundred and sixty-eight children received prophylactic treatment; some received one treatment, some two, and some three. The total number of prophylactic treatments given was fourteen thousand three hundred and

forty. The supervisors gave tooth-brush drills to twelve thousand five hundred and forty-six children. Dr. Fones and Dr. Strang gave stereoptican lectures to seven thousand four hundred and forty-seven children.

This can be done, and should be done, in every city in the country, and it will be done when the members of our dental societies realize the importance of the work and the responsibilities resting upon them.

Preventive Dentistry

BY RUSSELL W. BUNTING, D.D. SC., ANN ARBOR, MICHIGAN.

PREVENTIVE dentistry and preventive medicine are very closely allied. The progress of preventive medicine in the past few years has been rapid. Discoveries have come in quick succession whereby radical changes have been made in our knowledge of the subject and iron-clad ideas have given place to newer conceptions. One of the chief results of these investigations has been the accentuation of the importance of infection. Many general diseases, which were formerly thought to be due to a variety of causes, have been traced back to infection as a primal causative factor. The recent work of Billings, Rosenow, Hartzell and many others has proven without doubt that there is a direct relation between certain localized infections and lesions of the heart, articulatory joints, gall-bladder, appendix, etc. Indeed there seem to be but few diseased conditions which cannot be traced either directly or indirectly to infection.

Preventive medicine of to-day is seeking to determine the ways and means by which the bacteria or their products gain entrance to the body to produce their untoward effects, and to devise methods by which such invasion may be prevented. The present view of the situation is that the great majority of these infections are localized about the mouth, and either they or their poisons find access to the human economy very largely by three definite avenues.

One, by way of the tonsillar crypts.

Second, by way of abscesses which exist in the alveolar process at the apex of the root of a tooth.

Third, by way of spaces and pockets about the teeth produced by periodontal inflammation.

Among these important portals of entry by which infection may reach the circulation, two are to be found in the mouth. Because, then, of the proven significance of such mouth conditions and their

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sinister effect upon the whole economy, preventive medicine, which is to be effective, must include preventive dentistry. In the practise then of preventive medicine and dentistry, we must seek to close these two avenues of infection which lie within the mouth and to devise methods by which these locations shall be made permanently impervious to the invasion of organisms.

In the first of these two mouth conditions, we find that dental abscesses are very largely the result of infection introduced into the tissues through the death of pulps of teeth, or by filling procedures which are intended to replace that organ. To prevent such occurrences we have sought in every way to perfect our technic of root-canal filling to the end that root canal infection of apical tissue cannot occur. But, at its best, the filling of root-canals has proven to be a difficult and hazardous operation. There is, in fact, but one safe and compatible root-canal filling, and that is a live and healthy pulp. Could we but keep the pulps of all teeth alive and in health, this avenue of infection, in most cases, would be forever sealed.

But the maintenance of a live pulp in a tooth, necessitates that it be protected from the untoward influences which irritate it and induce its inflammation and death. Of the sources of these harmful irritations, by far the largest is caries of the teeth. Could we but prevent dental caries, the great majority of tooth pulps would remain in health and vital activity throughout the life of the individual. In the prevention of entrance of infection to the body through the avenue of periapical abscess, we should seek by all means to prevent the primal cause of these conditions, the greatest of which is dental caries.

In the second avenue of infection we find bacteria and their toxins gaining entrance to the blood stream through the diseased tissues about the necks of the teeth. Normally, and in health, the mucous membrane of the mouth is resistant to infection and bacteria do not find an easy entrance to the deeper tissues beneath. The most vulnerable area of this membrane is to be found in those portions which exist as holes through which the teeth have protruded. Normally, these tissues have a firm attachment to the peridental membrane and hug tightly about the teeth, but in disease this attachment and adaptation is destroyed, disease producing bacteria grow freely and find a ready access to the peridental lymph and blood spaces, whereby they may become a menace to the whole body. In the prevention of entrance of infection to the body through these tissues we should seek by all means to keep the mucous membrane at the gingiva of the teeth in good health and normal protective power.

Thus we see that could we but thoroughly and effectively prevent these two dental diseases we would render a valuable assistance to the practice of preventive medicine in that we would thereby close two important avenues by which localized bacteria may produce serious harm to the bodily economy. It is, then, the purpose of

this paper to review, with you, our present knowledge of the prevention of these two dental diseases. We shall attempt in such a presentation to classify the various causes of these two conditions according to the classification of causes of general disease. In all of which we are fully aware of the multiplicity of factors which may enter into the problem in each case, but we shall endeavor to state only those which are most prominent, which occur most frequently and about which we have the most definite information.

In his classification of general diseases, Adami distinguishes two general groups of causes, namely, exciting and predisposing. Of these, the exciting causes are the proximate or active agents which actually produce the change in normality which result in a specific pathological condition. An example of this class of causes may be found in the infectious diseases in which the exciting cause is the specific bacteria which produce their characteristic disease. But such bacteria are not always able to produce disease. They are everywhere in nature and the human body is constantly brought in contact with them. Certain infections have a high degree of virulence which enables them to gain entrance to the tissues and produce disease whenever they come in contact with them. But the great majority of infections have not that power unless they are preceded or assisted by that other class of conditions which prepare the tissues of the body for the entrance of the bacteria and permit their characteristic action within the economy. The predisposing causes, therefore, are in many cases, the determining factors which inaugurate the various disease processes. Pneumococcus is the frequent inhabitant of the mouth and throat, but in health the body is not affected by it. Cold, fatigue, or an attack of influenza may lower the resistance of the body and create conditions favorable for the onset of pneumonia. So also pneumonia in turn may become the predisposing cause of tuberculosis of which the acid fast bacillus is the exciting organism.

In applying this method of analysis to dental caries, we find that there is no one specific bacteria which may be spoken of as the exciting cause, but rather it is one or more of a large class of bacteria which are able to form acid when acting upon carbohydrates. Such organisms, when localized, produce organic acids capable of decalcifying tooth structure, which process is characteristic of dental caries. But by virtue of the fact that caries-producing bacteria are present in all mouths, and that in many the disease does not occur, it may be seen that the action of the exciting causes is dependent upon certain other predisposing factors which are necessary to caries production. This being true, the variable factors which determine the occurrence of caries is not to be found in the exciting causes, alone, but rather in those factors which are predisposing to their action.

We, then, are confronted with a long list of predisposing condi-

tions which exist in the various cases in an almost endless number of combinations. Pickerill has estimated that there are 3,628,000 such combinations, which is to say that of this number of caries, no two might have exactly the same group of causes. We have then in our study of the cause of caries, ceased to hope for the discovery of any one, all predominating factor, which in all cases, by its presence or absence, will determine the inception of the caries process. We rather consider caries to be determined by the balance of power of several predisposing factors, which in their combinations in one case swing the tendency toward immunity, and in the other toward susceptibility. So that the study of that subject is directed toward the determination of the relative importance and *modus operandi* of some of these factors in the effort to establish methods of increasing those conditions which tend to swing the balance toward immunity.

Of all the predisposing causes which may be concerned in dental caries, the following arbitrary grouping of the most prominent of these may be made:

1. The resistance of the tooth.
2. The localization and protection of the exciting organisms, and the concentration of the acids which they produce upon the tooth.
3. The amount of carbohydrates available for fermentation.
4. The lack of neutralizing properties in the saliva.

The importance of enamel surfaces as a predisposing factor is not determined. Clinically, many are convinced that certain enamels are soft and more easily broken down, and that such teeth are more prone to caries for that reason. But, in view of the fact that the hardest and most perfect enamel may quickly succumb to the action of the acids of caries, while many teeth, which are evidently of poor formation, may suffer little from caries, the resistance of the enamel, per se, does not appear to be of major importance.

A more direct relation may be seen in those predisposing causes which enable the exciting organism of caries to act in a concerted manner, which confine the acids which these bacteria produce against the enamel surface, and which protect such acids from neutralization by the saliva. In this class of predisposing causes, we must include, the sulci of the teeth, all imperfections of tooth-form, overhanging fillings, crowns, etc., which mechanically may protect a growth centre of caries exciting organisms. Also there are all those irregularities of the teeth which make them difficult to cleanse, the amount of salivary mucus which has the tendency to stick foreign material to the teeth, the methods and habits of mastication, the personal care of the mouth by the individual, and all those conditions which are included under oral hygiene in its broadest sense. Any one, or a group of these above named conditions, may establish favorable places for the growth of the bacteria of caries, where they may multiply, produce their characteristic acids and decalcify the teeth, with-

out which predisposing factors the exciting causes of that disease could not be effective.

But these bacteria which are capable of producing caries cannot be operative unless there be a sufficient amount of carbohydrate for their consumption in acid fermentation. So that an abundance of carbohydrates in the form of sugars is a predisposing factor to caries production. The amount of such carbohydrate is determined by the diet and all those factors named above which control the hygiene of the mouth, they simultaneously localize and protect the bacteria and offer means of lodgment for carbohydrates in their vicinity. These two classes of factors work hand in hand to augment caries.

In our consideration of these factors there still remains one other class of influences which may have a greater importance than any which thus far have been mentioned. Cases frequently are seen in which, seemingly, all the foregoing predisposing causes are present, in which oral hygiene is imperfect and yet caries does not occur. In such cases it is possible that certain properties of the saliva may have the power to neutralize or render inert the acids which have been produced by fermentation. There is in most salivas a variable amount of alkaline principles, which if conditions allow, will unite with the acids of caries and prevent them from decalcifying the tooth. An absence, or small amount of these antacid principles in the saliva would be a factor of predisposition by which the acids of caries might become operative.

In addition to the alkaline elements, many salivas possess an abundance of heavy mucus. Thus mucus may gather upon the teeth with great rapidity and form a veritable covering or coat for them. Certain of these mucinous deposits plainly are seen to be protective in that they absorb the acids and keep them from the enamel, and when broken down by bacterial action they form alkaline end-products. Little is known of the nature, source, or action of these beneficial mucins, but it is very evident that in certain cases they have a very important part in the prevention of caries. On the other hand, it frequently occurs that the oral mucins have a high acid content and do not protect the tooth, but predisposes toward enamel destruction.

In the study of methods and means whereby dental caries might be prevented, an attempt has been made to remove the exciting causes of that disease by decreasing all mouth infection. It was soon found that if germicidal agents were used continuously, the tissues of the mouth were also injured and degenerations were produced, while the mouth flora quickly regenerated after such spasmodic attenuation. The most practical method of decreasing oral infection is to be found in the use of washes and prophylactic measures, which mechanically remove a large number of bacteria and decrease the food upon which they live. A thorough application of these

principles will very materially decrease the number of mouth organisms.

As regards the control of the vast array of predisposing factors, which enter into the process of caries, less definite information is at hand and much still remains to be determined. A great deal of serious thought and endeavor is being given to the investigation of these factors in search of methods by which the predisposing causes may be decreased, and secondarily, the action of the exciting causes made less probable.

Of all the research which has been reported, only one suggestion of a practical preventive importance at the present time has any general acceptance, namely, the use of fruits and fruit acids as described by Pickerill, Gies, and others. It has been asserted by these men that acid foods and mouth washes produce a reaction on the part of the salivary glands, which causes them to pour out a secretion which is thinner in consistency and more alkaline in reaction. This reaction is noted directly after the use of such foods and continues for a short time after. Also that a continued use of such acid diet will result in a permanent thinning of the saliva and an increase of its alkaline constituents. Considerable attention has been given to this phase of treatment and some degree of corroboratory evidence of a clinical nature has been obtained.

The plan, briefly stated, consists of the eating of fruits of a decidedly acid nature at the end of every meal and at night before retiring. Mouth washes of dilute vinegar or cream of tartar are used in the mouth toilet. In our hands, this treatment has resulted in a decided improvement of oral conditions in certain cases. The saliva has become thinner, the teeth more self-cleansing, and the alkalinity of the mouth is raised, all of which should have a direct effect in reducing the causes which predispose to caries. But in other instances, marked digestive disturbances are set up and the teeth take on an extreme sensitiveness. More clinical data should be obtained on this method in order that its real value may be determined.

In the work which Mr. U. G. Rickert and the writer have done in the University of Michigan during the past two years under the auspices of the Research Commission of the National Dental Association, several phases of the problem of caries prevention have been attacked. Of these, there are two which seem to give the most promise of returns, namely, the condition of the enamel surfaces and the calcium content of the saliva.

In the investigation of the enamel surfaces we have subjected a large number of teeth to silver nitrate, and after precipitation of the silver have sectioned them. By this method we have found that a large percentage of teeth are porous on their outer surfaces. This porosity usually consists of small tube-like openings, which enter the

enamel but a short distance, or in very poorly formed teeth, the permeability extends entirely through the enamel to the dento-enamel junction. Specially is this seen in the cervical portion of the teeth when the hygiene has been poor and microbic plaques have persisted, which frequently produce a complete permeation of the cervical enamel. It is seen that teeth of a high degree of organization, the strong highly glazed variety, are usually almost impervious to the silver salts. Also that teeth of an inferior quality, when worn by abrasion, present an enamel surface at the point of attrition, which is dense and lacking in porosity. When the surface of the ordinary forms of enamel is reduced by grinding or polishing until the porous exterior has been removed, the surface then obtained is usually dense and admits little penetration by liquids. Several teeth, which had been under prophylactic treatment for some time, were examined in this manner. They had highly polished and opascent surfaces, which were impervious to the silver nitrate. It did not appear that the enamel surfaces had been reduced materially, but the action of continued polishing seemed to be similar to that of abrasion, producing a solid and dense surface.

All of this led us to enquire into the possibility of treating the enamel of the teeth in such a manner they would become condensed and less pervious to the fluids of the mouth and the products of bacteria. Such dense and polished surfaces obviously would be more self-cleansing, and would offer less ready attachment for microbic plaques, mucin, etc., which would be an important factor in the limitation of dental caries. The methods by which this condensation may take place are not clear, but it is possible that under certain circumstances the calcium salts from the saliva may precipitate into the openings in the enamel and fill them. Pickerill says that the enamel of all teeth is extremely porous when they are first erupted, but that on contact with the saliva, their surfaces become more dense, which change the attributes to precipitation of salts from the saliva into the imperfections of the enamel surface. If this be true, and there seems to be evidence that it may be, the enamel of all teeth is condensed on its outer surface by virtue of some action of the saliva, and we may reason, *a priori*, that the variations in condensation of the enamels of various teeth is dependent to a large extent upon the nature and chemical composition of the saliva. That is, that one saliva may produce hard and dense surfaces upon the teeth which they bathe, while another saliva will lack the properties which are necessary for that action, and the enamel of the teeth will remain in the porous condition in which they were erupted.

In pursuance of this problem we have looked into the amount of calcium which is available in the various salivas for this process of condensation. We find that the salivas of various individuals differ in the amount of calcium which they contain, and that in each case

the calcium content is fairly constant from day to day. It is also noted that a relatively high calcium finding in the saliva is usually associated with teeth which are hard and firm in texture and even in color, while in case the calcium is low the teeth are frequently whitish in appearance and do not possess good surfaces. The results which have thus far been obtained in this study are not conclusive enough to warrant making any definite statements, but the indications have led us to devote a considerable amount of time in the attempt to correlate the calcium content of the saliva with the condition of the enamel surfaces and the occurrence of caries. Of all the various principles of the saliva which we have thus far studied, none of them in our hands, have shown as marked a relationship to caries susceptibility as does the calcium findings. If it be true that a high calcium content of the saliva serves to consolidate the enamel surfaces, and if by its alkaline properties it may neutralize the products of carious fermentation, the increase of that salt in the saliva should act as an efficient aid in caries prevention. In this connection we have attempted by various ways to increase the amount of calcium in the saliva by artificial means, such as feeding, stimulation, etc., and experiments are now under way at the present time which are directed toward that end.

In all of this work but one feature has thus far been established as being of practical importance, and that is the beneficial change which is induced in enamel surfaces by mechanical rubbing or polishing. The enamel of teeth which are rubbed either by abrasion of one tooth upon another, or by the judicious polishing and cleansing which has been continued over a considerable length of time undergoes a surface condensation. This may be noted in the change in the external appearance of such enamel surfaces and in the decrease of permeability to silver nitrate.

In a consideration of the practical methods of prevention of dental caries which are available at the present time we find that those measures which are employed in the production and maintenance of oral hygiene offer much that is of value. Stated in the broadest terms they may be said to be an attempt to make the mouth more self-cleansing and more easily cared for by the personal effort of the patient. The effect of such treatment would be the reduction of the amount of food debris retained about the teeth and a disturbance of the localized centres of fermentation, both of which are important predisposing factors in dental caries. So that such prophylactic measures, looking toward the highest state of oral hygiene, theoretically should prevent dental caries. The question arises, does it do so clinically? Regarding this there is a difference of opinion. Many claim that prophylactic treatment in any form, does not prevent caries, and they are very positive in their assertions as borne out by their own clinical experience. While of those who are practising

oral prophylaxis most intensively, and are giving a large portion of their time and attention to such practice, invariably they assert that, in their experience, although oral prophylaxis does not prevent every individual case of tooth-decay, it materially decreases the occurrence and in a large number of cases renders the mouth immune to that disease.

In our study of the effectiveness of oral prophylaxis we have become convinced that the results to be obtained are dependent very largely upon the thoroughness with which these measures are carried out by the operator. The ordinary cleansing of the teeth has but little effect and is of doubtful value in caries prevention. When upon examination we find that in the great majority of teeth the enamel surfaces are rough, we can realize how quickly new deposits of food-stuffs and bacteria will reattach themselves to those surfaces, and what difficulty is offered to their removal by the action of brush and dentifrices. When, on the other hand, the teeth are polished until they are smooth on all of their surfaces, they mechanically retain far less extraneous matter and they are more readily cleansed by any friction which may be applied to them. In addition to this, the practice of adapting all crowns and fillings so that they are absolutely flush with the tooth surfaces, and contouring them so that they are in close contact with their neighbors, and in normal occlusion with their antagonists, markedly decreases the amount of food retained about the teeth. But, no matter how thoroughly the work of cleansing and polishing tooth surfaces be done, the factor of supreme importance is that of the care which is subsequently given those teeth by the patient. Spasmodic cleansing has but little effect, and the continued maintenance of mouth hygiene can only be accomplished by proper instruction of and co-operation by the patient.

In such cases, then, in which the highest state of oral hygiene is obtained and maintained, the exciting cause of dental caries will be diminished, the predisposing factors which cause the micro-organisms to become localized and which furnish the food material for fermentation will be greatly inhibited, and the balance of caries producing forces may, by virtue of this condition, be thrown over to the side of immunity. But if this process is but incompletely carried out and retention centres are left undisturbed, or if uncontrollable factors are present which are of extreme virulence, the balance, in spite of all prophylactic measures may be swung toward susceptibility and dental caries ensue. In caries prevention, then, oral prophylaxis may be incomplete and leave much to be desired. Still, at the present state of our knowledge, these measures, when carried out in their most thorough manner, offer the greatest aid to caries prevention which are known. We fully believe that the developments of the studies of the subject which are now being made, will shed further light upon the problem and will suggest other and perhaps more

effective methods which will either enlarge or supplant those measures which we now know and employ.

In the consideration of that other group of diseases which affect the tissues about the tooth, we may distinguish three distinct phases of disturbances. The simplest of these is gingivitis, in which the gingival tissues undergo functional and circulatory changes; second, a more advanced stage of disturbance, known as interstitial gingivitis, in which the deeper tissues, the pericementum and bone become involved, and third, those conditions in which the deeper lesions become inhabited by pyogenic bacteria and pus is produced, namely, suppurative pericementitis of pyorrhea alveolaris. These three conditions are a chain of links in which one follows the other in the order named, and such is the order by which the great majority of periodontal diseases run their course. It is true that a certain number of cases are seen in which the process of periodontal tissue destruction is more nearly related to atrophy and degeneration than to inflammatory conditions, but these, in our opinion, are extremely rare as compared with the other more commonly occurring forms, and which will not be considered at this time.

Let us consider the typical case which is so frequently met with in its various stages of progress. Begin, if you will, with the normal conditions in which the gum festoons hug tightly up against the tooth on all sides. The color of the tissues is an even pink, being slightly lighter than the color of the blood. In such conditions the epithelium of the mucous membrane continues over the gingival crest down into the gingival space and unites with the pericementum at its attachment in the bottom of that space about the tooth. In such conditions the tissues are completely covered on all exposed surfaces with a healthy epithelium, which is resistant to the action of bacteria. As a rule, the first departure from normality is noted in the change in gum color and the loss of tonicity of the gingival tissues which results in their falling away from the tooth. The color of these tissues turns to a deeper red, denoting active hyperemia, later changing to blue and purple when the gum circulation is in the state of passive or congestive hyperemia. If the process continues, inflammation results and the health and attachment of the periodontal tissues is impaired. Progressively, the inflammatory process is communicated to the deeper tissues with the destruction of a portion of the pericemental membrane and a wasting of the bone which forms the alveolus. When pus-producing bacteria are present, a liquefaction of these tissues is effected and true pyorrhea has been accomplished. The course of this process as outlined will be determined by the nature and severity of the causative factors and by the vital activity and resistance of the tissues involved.

And what are the causative factors of pyorrhea? This is a question which recently has excited much discussion and has been the

subject of volumes of literature. The opinions which have been given have been of such diverse nature, and many of them have been so wide of the truth, that a considerable confusion has arisen in the minds of many regarding the exact nature of the process under consideration. Indeed, these periodontal affections are complicated in that they have many phases and manifestations, but the most commonly occurring varieties are the result of certain definite conditions which may be classified after the manner of general diseases.

The exciting cause of the first class of diseases known as gingivitis in a great majority of cases, is some form of local irritation. The irritation may be from mechanical source, such as tartar, impaction of food, overhanging fillings, etc., by chemical means, such as irritating acids, drugs or nicotine, or by the biochemical products of bacteria. Any one, or a group of these causes, by their irritating effects, may excite an abnormal circulation in the gingival tissues. The predisposing cause of such conditions are the untoward factors of faulty oral hygiene, which allow these irritative materials to remain in contact with the gingival tissues until they had produced their characteristic effects.

In the second class of periodontal diseases in which the deeper tissues have become involved, we can usually distinguish the chief exciting cause to be some form of micro-organism which has gained entrance to the gingival space from the mouth cavity. Among these are to be found the various forms of streptococcus, staphylococcus, pneumococcus, spirilla, fusiform bacillus, entamoeba, etc. These various organisms find in the damaged subgingival tissues a splendid field for growth and multiplication, where they may produce their characteristic action. The virulence of their attack is determined by the particular strain or strains of organisms which happen to be in predominance in each individual case. When they are of the pus-producing type they liquify the tissues and produce the third type of disease, suppurative periodontitis.

The predisposing causes of the two more severe types of disease are to be found in the gingivitis which inaugurated the process, without which few of these deep-seated and advanced stages of periodontal disease would exist. Cases frequently occur in which the exciting cause of the initial gingivitis is bacteria growing in transparent plaques at the cervical portion of teeth. These same bacteria, by such preparation of the gingival tissues, may find entrance to the deeper structures and be the exciting cause of the more severe type of disease. In such cases tartar and other forms of local irritation may be entirely lacking.

The question may be raised as to the part which is played by the internal exciting causes, such as insoluble products, which may float in the blood stream and lodge in the capillaries of the periodontal

tissues, where by their irritation they may produce inflammatory conditions. An example of such internal irritants may be found in the insoluble salts of mercury, which are the frequent cause of mercurial stomatitis. It has been found in many hospitals, where large amounts of mercury are given in the treatment of syphilis, that if the teeth are kept thoroughly clean and free from all deposits, that large quantities of mercury may be given without any gingivitis being produced. From which it may be deduced that local irritation produces circulatory changes in the gums which predispose that tissue to the lodgement of mercuric salts, but in case the circulation is normal, those irritating materials in the blood pass through the capillaries unimpeded. It may also be reasonably inferred that the same conditions obtain in case of other drugs and auto-intoxications which may be present in the blood stream.

Substantiation of this view may be seen in the fact that in those cases in which internal intoxications, such as gout, uremia, etc., are closely associated with the manifestations of periodontal disease, that when these cases are put under treatment and the progress of the disease is arrested, they usually may be permanently controlled by the simple maintenance of strict oral hygiene. In which case, again, the removal of local irritation and the restoration of the gingival circulation to normal, markedly prevents the further lodgement of circulatory irritants.

A very common chain of predisposing causes of periodontal disease may be seen to consist of the accumulation of foreign materials and fermentative processes upon the teeth at their gingival border, inducing gingivitis. This in turn prepares the deeper tissue for invasion by pathogenic and pyogenic organisms from the oral cavity, which produce the destruction of those parts. So that in the so-called pyorrhetic conditions, as well as in dental caries, the important factors of inception are not to be found in the exciting causes, which are always at hand, in health as well as disease, but the determining principle rather is to be found in those conditions which predispose the tissues to the action of the destructive and exciting agents. In the case of periodontal disease these predisposing causes are very largely found to be some form of irritation. Mechanical, chemical, and bacterial irritations are to be found existing as primal causes in the great majority of cases without which the destruction of tissue by whatever the form of micro-organism would not have taken place. It is true that such periodontal inflammation is also dependent upon and may be induced by departures from a state of health of the whole body, which may alter the circulation and lower the normal resistance of those tissues, but of all the cases which are presented for clinical study, those which are produced by the local irritative factors by far overbalance those which are of a general or system source. Evidence of this is seen in the marked improvement which

is obtained in practically all cases when the mouth is placed in the state of strict hygiene.

Prevention, then, of such conditions should consist of the perfection of methods of procedure by which these various local irritating materials might be continuously kept from the vicinity of the gingival tissues and the resistance of all mucous surfaces raised to the highest degree. This again involves the obtainence and maintenance of the highest form of oral hygiene. Polishing and shaping of the teeth, and artificial substitutes so that they may be self-cleansing and offer the least possible retention to food debris, tends to diminish the irritation by food impaction, and enables the patient by proper training and co-operation to keep the teeth relatively free from all irritative materials. In addition to this, the patient in the personal care of his teeth, if a stiff brush be properly used high up on the gums, will stimulate the circulation to the gingiva, and will by friction excite the formation of a thicker and tougher epithelium, which will be more resistant to injuries than is the average. In this manner he simulates the harsh scrubbing of coarse and tough foods which the lower animals consume, and which so largely have disappeared from our diet. Clinical evidence has shown that mouths so cared for seldom suffer from gingivitis the first stage of the process. It is also clinically evident that, in all those cases in which gingivitis has set in, the surgical removal of all tartar and elimination of centres of food accumulation, the polishing of the teeth and the proper care by the patient usually results in a return of the tissue to a permanent normality.

It is further seen that the most successful operators upon periodontal diseases to-day are confining their treatment to simple measures of absolute oral cleanliness. They do not enquire as to the exact nature of the specific organisms involved, but direct their energies solely to rendering the entire crown and diseased root surfaces as smooth and self-cleansing as possible. With such surgical treatment alone, they, in a great majority of cases, induce the periodontal tissues to return to a healthy state, and are able to maintain them as such as long as the practice of oral hygienic principles be continued. May it not therefore be reasoned, that in such cases had these same oral hygienic principles been employed previous to the inception of periodontal disease that it would not have occurred?

But in order that these prophylactic measures which have been referred to be a benefit to the dental tissues, all such operations must be carefully and judiciously carried out. Excessive and unwarranted grinding of the enamel will produce sensitiveness to the teeth and great discomfort to the patient. So also, extensive and vigorous instrumentation of tooth surfaces beneath the normal gingiva will injure the attachment of the periodontal tissues to the root and will destroy the very relations which we seek to conserve. It is to be deplored that many operators, with seemingly good intentions, are sacrificing

a considerable portion of enamel substance, and are destroying the close proximal contacts in their effort to make teeth self-cleansing. Such practice is wholly unwarranted, unnecessary and dangerous. The object to be obtained is a polished enamel surface, and this may be attained in most instances by the removal of but an infinitesimal thickness of enamel substance. This may be compared to the polishing of a gold crown, in which an effort is made to obtain a smooth surface with a minimum loss of gold thickness, and the smooth surface so obtained is subsequently given a high polish. So also the enamel surfaces beneath the gingiva and in the interproximal surfaces may be smoothed and polished by careful instrumentation and safe and sane methods of technic, but in all cases the greatest care must be exercised to prevent the injury or destruction of soft tissues, which are in the state of normality or near normality at the time. Such operations must then be safely and sanely performed, but to be effective they must be so thoroughly carried out that all irritations be completely removed. Such simple, conservative and thorough measures, in the great majority of cases, will maintain the normal tissues in health and will produce a decided improvement in those which are suffering from peridental disease.

In conclusion, we may say that in the practice of preventive dentistry, as applied to caries and peridental disease, the most practical measures of procedure lie in the production and maintenance of oral hygiene. If we would prevent caries, we must keep the teeth free from the localization of bacterial growth and accumulations of food materials. If we would prevent peridental diseases we must prevent all local irritations to the gum tissues. We should make it an invariable practice to examine tooth surfaces and read the gum colors in all cases which come under our supervision. We should consider the slightest change from the normal pink color of the gingiva as a signal of danger, and should bend every energy in the effort to remove the irritation of whatever nature it may be, and continue such prophylactic measures until the peridental tissues have returned to their normal color and tone. We should endeavor to perfect our technic of oral prophylaxis beyond the point of simply cleaning teeth, but rather strive to produce tooth surfaces which are mechanically smooth and polished, in a condition in which they may be kept relatively clean. We then should direct the efforts of our patients by frequent and personal supervision and insist that each surface of every tooth be properly cleansed at least once daily. And in all our consideration of these diseases we must not overlook the intimate relation of the health of the whole body to the health of the mouth tissues, and by suitable corrective and prophylactic measures of a general nature seek to bring the health of the whole body to its highest state of perfection whereby we will most effectively render it immune to disease — *Dental Review*.

Horticulture for the City Dentist.

FRED G. BRETHOUR, D.D.S., TORONTO.

[*Dr. Brethour has met with exceptional success this year with some of the products of his garden. At the July Show of the Toronto Horticultural Society Dr. Brethour exhibited Peonies and Perennials (open class) and was awarded the gold medal in the latter class and first and second prizes in the former. This article will doubtless prove both a help and inspiration to the city dentist who takes health and pleasure out of his flower garden.—*EDITOR.]

IT is said that the average professional life of a city dentist is but twenty years. Why should this be so? A dentist is not practising very long before he realizes that he has chosen an exacting profession. The nervous strain and close confinement, the intense application of the mental faculties, along with more or less worry, soon begins to tell. The wise dentist regulates his hours and takes some form of relaxation to restore lost energy, while the foolish one works along in the same old rut until he peters out, and we read in the morning papers of some one of our most promising practitioners being cut off in the prime of life.

It is necessary that some form of recreation should be adopted. Some try one thing, some another. I have had a number of fads, and the latest and most lasting of these is horticulture, and I want to advance a few reasons why I think this is ideal. Right here I would like to give a few words of advice to the young dentist, and that is to *buy* a house, even if he can only make a small payment. Buy a good one, too; you can pay for it all right. There is not the least bit of doubt of that if you are any good. And see that there is a decent sized lot with it, and while you are about it try to get as good soil as possible—that will help you out later.

It is maintained that every third generation must get back to the land for the good of the race, and what would be better still for you and yours would be for you to be in close touch with mother nature all the time. This is possible with even a small piece of ground, such as is found in an ordinary city lot. What I am going to say applies solely to the growing of flowers, but it can also apply to any other



Peonies

form of horticulture with equal benefit. Now, what are the benefits? In the first place, it is essentially an outdoor recreation for at least nine months of the year, and yet it is not merely an occupation for the bright days of spring and summer. When you begin to study the nature and requirements of what you are growing, and all other subjects parallel with that, a task awaits you for each and every day of the whole year. Who can name another form of recreation that is good for the whole three hundred and sixty-five days?

The love of flowers is instinct in mankind. The youngest child loves them, and in later years, to grow and perfect them is one of the purest, most interesting and most delightful of all human pleasures. Gardening establishes in one's character the virtues of patience, will power, diligence and application. It develops the faculties of observation, ingenuity, foresight and alertness. Its moral effect, perhaps, is the greatest of all. The colors, the perfumes, the birds and the butterflies, the bees and the insects, some good and some bad—the metamorphosis from the tiniest seed, to a tall plant with a beautiful color and delicious fragrance, cannot help but have a refining and a softening tendency.

A garden makes a family fond of their home. The children love it. All through the days of childhood it is their fairyland of sweet enchantment and innocent wonder. Then, again, if we consider the physical aspects of gardening, it has no equal. As I said before, it takes you outdoors. It brings into play nearly every muscle (I have no use for one who gets a man to do the hard work). It thus invigorates and makes your nerves steadier. It creates a healthy appetite, and as an antidote for worry and insomnia it cannot be excelled. You sleep like a hired man on Sunday morning.

Now, you say this sounds fine. Tell us how to do it. That is a long story, too long for such an article as this. I might say that five

years ago I knew very little of the fine points of the game. I joined the Toronto Horticultural Society, where they have scientific papers in the winter months and flower shows in the summer months. I bought books. I wrote to the Agricultural College at Ottawa for everything they had of any value. I also wrote to Washington, and sent enough money to pay for numerous pamphlets. Then I got all the catalogues I could hear tell of, and now I can tell a Scotch thistle from a peony all right. We will say you have a piece of ground 30, 40 or 50 by 125 or 150 feet. Now if you want an artistic garden aim at simplicity. You cannot make an Italian garden or a Japanese garden with that space. The setting for your garden must be your lawn. Flowers are an adjunct. Learn something about lawns, how they should be made, and then fertilize and keep up. Don't make the mistake of having flower beds scattered here and there; confine them to the borders. As for borders, make them at least five feet wide, from that to twelve feet, and make your outline in nice, graceful curves. Straight lines are very inartistic, but often have to be used in some places, however. You thus make a plan for your border. Now comes the real work. Your ground must be well cultivated and fertilized. The fall is the time to do that, and don't undertake too much at once, for it must be done well if you are going to grow perennials. I grow nothing else and cultivate the ground in this way. Mark off about 30 or 40 feet in 3 or 4-foot spaces. You will find ordinarily that the top six or eight inches is fairly rich. That's the top soil, of course. From your first 3 or 4-foot space remove this top soil and convey it to the end of your 30 or 40-foot space. Now you have your sub-soil. We will say it is pretty heavy clay. This has to be dug down two feet and thrown up on the sides. You will have a hole now almost three feet deep. Throw in your well-rotted manure, a good layer, and dig this in thoroughly before putting in any of the earth, then add a por-



Delphinium

tion of your soil and throw in more manure, and dig this in thoroughly. Keep doing this until you have the earth all back. This is called trenching. Start on your next space, and the top soil of it is spread over the space you have just been working on, and so on, until you have finished. For fertilizer you can use well-rotted horse or cow manure, supplemented if you wish with sheep manure, bone-meal, woodashes, etc. Do a little of this digging every night and morning and you won't need anybody to rock you to sleep. Now, what have you got? You have a soil that is not going to peter out the first year. I haven't said anything about drainage. Most Toronto land is naturally well drained. Supposing this is all you are going to cultivate the first year, get busy on your catalogues. Decide what will give you continuation of bloom, what color combination will harmonize, and figure out the tall growing stuff from the low growing. Don't see how many different things you can plant in that space. The best effect is in grouping a number of the same things together, never less than three of a kind. Plant only the good things. If you cannot get the best varieties here, import them from England, or France, or the United States. It is just as easy growing good varieties as ordinary ones and much more satisfactory. For continuation of bloom, for April and early May you must depend on bulbs. I prefer Darwin and Cottage tulips and daffodils. These must be planted in the fall. For later, May, there are aquilegia, trollius, pyrethrums, iris, etc. For June you have poppies, peonies, roses, campanulas. For July roses, delphinium, early phlox, thalictrum, lillies, Japanese iris, etc. For August, roses, phlox, Shasta daisies, etc., and for fall there are rudbekias, roses, chrysanthemums, Michaelmas daisies, heleniums, etc. Then you have the whole shrub family from which you can get bloom the whole season, and the climbers. Plant your stuff in the spring the first year, with exception of bulbs, lillies, Oriental poppies and peonies, which should be planted in the fall.

This is beginning to get complicated. Don't expect you are going to do everything right from the start. You will learn a whole lot by experience—the same as in your profession. You are not going to learn much out of books, but it will help you a lot to get some good gardening magazine.

Now, we will imagine your plants all growing nicely, where does the pleasure come in? You will find all this is pleasure. You have forgotten all about that nervous patient you were working for, or about that fellow who left the country owing you your fee. You get up early in the morning, about five o'clock we will say, you will hear the singing of birds you never heard before, you will get whiffs of perfume that are the strongest at that hour, you will nose around to see what new flower the fairy fingers have opened up during the night, and with your sharp knife you will just snip off a nice bunch of roses,

or two or three nice peonies, or whatever you fancy, and put them in water to be taken to the office. Is it worth while having a bunch of real flowers in the office, or is it just as well to have an old fern with rusty leaves, or nothing at all? I think a nicely arranged bouquet of fresh flowers in the office is a tonic to a nervous patient, and besides it lends a tone of refinement, and it shows that the dentist is making an effort to subdue the cold and forbidding look of the ordinary office. You put a few choice flowers in the office, and nine patients out of ten will speak about them. All women are lovers of flowers; there is a sympathetic bond between you, and I believe you can get along better with them. At any rate, you will have to tell all about those flowers, how you grow them, where to get them, and you are spreading knowledge, which possibly will make the world a little bit brighter. That's doing your "bit" to beautify the city. By giving this one a few seeds, and that one a plant or two, you perhaps are starting some one on your hobby, which cannot help but have a beneficial effect on the individual and on the community as a whole. Why not help to make your city a city of beautiful gardens?

Technique of Root Canal Filling.

DEPARTMENT OF OPERATIVE DENTISTRY, ROYAL COLLEGE OF
DENTAL SURGEONS.

PREPARATION OF OPERATOR AND ASSISTANT.

THE operator and assistant should be dressed for aseptic operating. Hands should be scrubbed and dipped in alcohol. It is not necessary for the hands to touch any of the materials or instruments which enter the canals, rubber gloves may be worn.

PREPARATION OF FIELD OF OPERATION.

The patient's mouth should be sprayed and rinsed with flavored water (wintergreen or peppermint).

Rubber dam put in position.

Teeth exposed through rubber dam wiped off with alcohol or phenol.

Sealing removed.

Cavity wiped with alcohol and dried with warm air.

Dressing removed from canal and tested for odor and moisture. If the dressing is dipped into H_2O_2 effervescence will indicate presence of organic matter.

PREPARATION FOR OPERATION.

Bracket Table.

All instruments used in any former operations should be removed and only those of immediate necessity kept on the table. The whole

root canal equipment should be brought forth to the table sterile and ready for use without being handled by operator or assistant. The instruments and materials may be taken directly from the sterilizer as they are needed or from towels containing them which have been sterilized.

Among the equipment should be a number of smooth broaches already wound with absorbent cotton, cotton rolls, cotton pellets, rubber dam, cotton wipes, root canal cleansers, root canal reamers and root canal pluggers of various sizes and forms as well as dressing forceps and other pluggers.

Drying of Root Canals.

With sterile cotton on smooth broaches carry alcohol into the canal. Wipe out the excess alcohol with the prepared broaches and cotton and apply hot air. If using a chip blower draw the air through the flame into the rubber bulb, thus sterilizing the air and gradually blow into the canal. If using compressed air this is sterilized by passing through a vapor bath. Now pass a heated broach into the canal as often as necessary or until all fizzing ceases. This broach is made from piano wire or irridio-platinum. The canal is now dry and ready to receive the filling.

INDICATIONS FOR USE OF CHLORA-PERCHA.

1. In all root canals freely opened to the apex, but which have not large apical openings.
2. In canals in which posts are to be cemented.

The Technique of Insertion.

Moisten the canal with oil of cajuput or eucalyptus. Dry out excess of the lubricant with cotton. Pump chlora-percha into the canal with a smooth broach, a little cotton on the broach may assist at first, then pump with a smooth broach several times. It is usually wise to pump until the patient gives response. If the canal is hard to fill use unvulcanized rubber as in pressure anaesthesia to force the chlora-percha home. Select a gutta-percha cone which approximately fits the canal to the apex and pass it up the canal, perhaps withdrawing and re-inserting several times until it is well settled to place. Several cones may be required to fill the canal. If the patient responds to any pressure wait a few minutes and then press the cone farther. An easy way to handle the cone is to flatten the large end with a pair of pincers. When the cone is passed into the canal as far as it will go, pack and force it home with a root canal plugger, being careful not to punch holes in the cone and thus remove the mass. To accomplish this use a wad of cotton or paper over the gutta-percha to receive the thrust of the plugger. Cold air blown on the gutta-percha while packing facilitates the evaporation of the chloroform and makes a denser mass. Warm air or warm instruments expand the gutta-percha; cover the gutta-percha with

oxy-chloride of zinc or oxy-phosphate with 5 per cent. red oxide of mercury added to prevent infection.

THE INDICATIONS FOR THE USE OF ROSIN SOLUTION.

1. In fine canals which can be thoroughly dried.
2. Canals which have been the seat of septic infection.

The Technique of Insertion.

Flood the dry canal with a thin rosin solution pumping it in with a wisp of cotton on a small smooth broach. When the canal is full pass a fine bristle to the apex and let out any air that may be entrapped. This is of vital importance. (For X-Ray purposes dip the broach in oxide of bismuth and pump into the canal.) Now pass the gutta-percha cone up the canal. Have a rigid cone and pass it half way up the canal and pump up and down forty or fifty times, as it dissolves, pass further toward the apex. The solution will enter the tubuli. When the canal is full, pack down with a cold plugger and wipe away any excess rosin solution. Rub steel pluggers on paraffin or cocoa-butter to prevent them sticking to cone. Fill pulp chamber with oxy-chloride of zinc or oxy-phosphate to which has been added 5 per cent. red oxide of mercury.

INDICATIONS FOR THE USE OF PARAFFIN COMPOUND.

1. Large canals freely opened.
2. Under fillings where no force or pressure is going to drive it through the apex.
3. If apical irritation is feared.

The Technique of Insertion.

With a wisp of cotton on a bristle moisten the canal with pure paraffin oil or liquid alboline. Now place a paraffin cone in the canal and pack it to place with a heated copper wire (about 60 C), add enough paraffin to completely fill the canal and have the whole in a liquid state so as to leave a homogenous mass when the broach is removed. Pass a gutta-percha cone, or better, a copper wire into the canal and leave permanently. Seal the pulp chamber with oxy-chloride or oxy-phosphate to which has been added 5% red oxide of mercury.

INDICATIONS FOR THE USE OF BISMUTH PASTE.

1. Roots with large apical openings from absorption or lack of development.
2. Temporary teeth.
3. Punctured roots.
4. Bifurcated openings.

The Technique of Insertion.

Place the jar of paste in a hot water bath and when the mass is liquified carry some to the tooth with a syringe. The nozzle of the

syringe must be warm and large enough to take up and discharge the paste. It may be necessary to pack unvulcanized rubber around the nozzle to force the paste into the canal or use the rubber as a piston as in pressure anaesthesia. A gutta-percha cone may now be gently passed into the canal.

INDICATIONS FOR THE USE OF MUMNIFYING PASTE.

1. In fine root canals where it is impossible at the time to remove all the pulp.

2. A temporary expedient.

Technique of Insertion.

Moisten the canal with oil of cajuput or eucalyptus. Dry out the excess of the lubricant with cotton. Pump the mumnifying paste into the canal with a smooth broach, a little cotton on the broach may assist at first, then pump several times with a smooth broach. If the canal is hard to fill use unvulcanized rubber as in pressure anaesthesia to force the mumnifying paste home. Select a gutta-percha cone which approximately fits the canal, perhaps withdrawing and re-inserting several times until it is settled to place. Cover the mumnifying paste with oxy-chloride of zinc or oxy-phosphate to which has been added 5% red oxide of mercury.

MATERIALS FOR FILLING ROOT CANALS.

Gutta-Percha and Chloro-Percha. How to Make:

Take a jar that will hold about two to four ounces, fill it about three-quarters with pink base-plate gutta-percha cut into squares or strips small enough to settle well into the bottom of the jar. Pour over this enough chloroform to cover the gutta-percha fully. Allow to stand for a few hours, closely covered. Shake well, and much sediment will fall to the bottom; gutta-perchas now used are loaded with oxide of zinc and other materials that are not suitable ingredients of chloro-percha for filling root canals. To remove these strain through cheese cloth into a wide mouth bottle with an outside cover, which is not so likely to become smeared as a cork that fits inside. Finally, ground thymol crystals may be dissolved in chloroform and added, or may be thrown into the liquor undissolved—use about two or three drachms of thymol to an ounce of gutta-percha. As the chloroform evaporates add oil of cajuput to the solution to keep it liquid. After some months all the chloroform will have evaporated, and the gutta-percha will be held in solution by the oil of cajuput. This chloro-percha will be ropy and tenacious—not so short grained as that made from base-plate gutta-percha unstrained.

Gutta-Percha Cones put in a wide mouth bottle and covered with alcohol will thus be kept sterile and ready for use.

Pink gutta-percha is preferable to white, because the color makes a sufficient contrast to the teeth tissue to be easily followed if removal should be necessary.

Rosin and Gutta-Percha Compound.

Rosin Gr. xli
 Chloroform 3ii j
 M. Fiat Sol.

Place the rosin in a wide mouth bottle and add the chloroform, let stand for a few hours when it will be ready for use. A little vaseline put on the glass stopper of the bottle will help to keep the chloroform from evaporating.

Paraffin Compound.

Thymol 2 parts
 Bismuth trioxide 30 parts
 Hard Paraffin (melting point)
 56-58 deg. C. (133-136 deg. F.) 68 parts

The above formula may be put up by your druggist.

A very convenient and aseptic method is to have the paraffin for the compound made into cones and placed in alcohol. Liquid Alboline, Russian Oil or Petroleum is used as a lubricant for the canal.

Bismuth Paste.

Bismuth-Sub-nitrate 30 parts
 Yellow vaseline 60 parts
 White wax 5 parts
 Paraffin 5 parts

Mummifying Paste.

Oxide of zinc.
 Creosote or Oil of Cloves.
 Hymol.

—*Hya Yaka.*

Our Buffalo Letter.

BY HABEC.

I WILL just dash off a few lines to let ORAL HEALTH know that poor old *Habec* is still able to answer "present" to the roll call of Nearly Has-Beens. No doubt you had, mentally, placed a sprig of *Acacia* to mark the spot where hallowed memories might return to commune with the spirit of the departed devastator of the English language, but *Habec* hereby serves due and timely notice upon creditors and debtors alike that he is still on deck to give and receive as grudgingly as ever. Were it not that your typewriter (neuter gender) seems to be seriously afflicted by intermittency of action, and, in consequence, your reminder of *Habec's* long-delayed communication so infrequent, you would, doubtless, be saved the agony of such long suspense. However, we believe that you have

a right to more fully understand our reasons for playing the clam at a deaf-mute party.

It is all on account of the Preparedness League of American Dentists. Several moons since we organized the above institution, and although the three starters have worked very hard and undergone much personal inconvenience thereby, yet we have fully demonstrated the great need of the movement, and are satisfied that many times the personal effort thus far expended would be worth while. If you will print the principal points in the enclosed circular letter it will save the repetition of the objects of the work. We have a membership of over 1,200, representing thirty-eight states, Canada, Honolulu, Porto Rico and the Philippines. We have prepared a good many recruits who were rejected because of inadequate dental outfits and the most of them are now at the Mexican border. Several units have been established at different points for the practice of war oral and dental surgery, and many more are in process of organization.

The trustees of the National Dental Association extended us the privileges of the organization by giving the League a place on its programme at Louisville on July 25th inst., besides tendering the use of the Seelbach Hotel for an afternoon meeting. As at present arranged the speakers will be: Dr. J. D. Patterson, Kansas City; Dr. H. J. Burkhart, Batavia, N.Y.; Dr. H. E. Friesell, Pittsburgh, Pa., and H. A. Pullen, Buffalo. *Habec* will wield the gavel and pass the ice water.

Habec could write much on this subject, but he has ground it over and over so many times that it would only be a repetition, and no doubt many of the readers of ORAL HEALTH have seen articles on the subject in different dental journals and know our spiel by heart. We would like to add, however, that it is a wonderful work, and if we had ten times the energy to give we would be happy to place it on the altar of the Preparedness League of American Dentists.

Trusting we may be able to send you a little of the old time nonsense before long, we are, as always,

HABEC.

ORAL HEALTH publishes herewith a resume of a circular letter issued by the Preparedness League of American Dentists.

Dr. J. Wright Beach (otherwise known and most highly regarded as *Habec*) is chairman of the committee on organization, and along with his associates deserves great credit for the energy that has been shown in making the League an active force in the solution of the present dental problem of the United States army.

We quote as follows:

"The Preparedness League of American Dentists is organized to aid our Army Dental Corps by the voluntary service of its members,

and its active usefulness will cease when the Army Dental Corps becomes adequate to meet the demands upon it.

"It is primarily a registration bureau for all dentists of the United States, who agree to prepare the mouth of at least one applicant to meet the requirements for enlistment, subject to such rules as shall protect the dentist from imposition.

"Registration entails no further obligation on the members than is herein stated. It is the desire of the organizers to be able to assure the Surgeon-General of the United States Army, not later than July 1, 1916, that twenty thousand dentists have joined the League.

"This movement is for the purpose of providing immediate aid for our War Department, when exigencies require, and will in no way conflict with present or future legislation affecting the Army Dental Corps.

"Furthermore, the committee on organization has formulated a plan whereby those injured about the face and jaws during battle may receive skillful surgical and mechanical treatment by a corps of dentists specially trained for such purposes.

"Sections will be formed, with units in many of our cities, where instructions and clinics will be given in reference to special oral surgery and pathology, reduction of fractures, construction of splints, bone grafting; in short, such new conditions as have developed from the great war now raging in Europe. Dentists who have served at the American and other ambulance hospitals in Europe, and others of international reputation in their special branches, will assist in this work.

"It hardly seems necessary to add that the organizers of the League receive no compensation for their services, the object being purely humanitarian in character. Therefore, they feel justified in soliciting your earnest co-operation in a cause, the motives of which must ring true, and could be prompted only by American patriotism.

"Members will be active and associate. To become an active member of the League, the enclosed application blank must be accompanied by one dollar (\$1.00). An associate member may register with the League by forwarding the application blank without fee, full membership to be consummated upon payment of the fee when requested by the League.

CAVITY TOILET PREPARATORY TO THE INSERTION OF SYNTHETIC PORCELAIN.—The toilet of a cavity preparatory to the insertion of a synthetic porcelain filling must be as thorough as if a metal filling were to be used. To the ordinary toilet should be added the varnishing of the dentinal walls as a precaution against the material absorbing either acid or moisture from the walls or against the absorption of part of the fluid from the material by excessively desiccated dentin. Usually the rubber dam should be applied.—*Western Dental Journal*.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE DENTAL NURSE.

TWO of the most disturbing problems in dentistry is that of the treatment of children's teeth and prophylaxis. They are disturbing because, in the first place, time and patient effort, far exceeding that thought necessary by the average person, are required, and secondly, because of the frequent lack of appreciation of such efforts.

No one who has had experience in dental practice will take issue with the statement that the care of children's teeth calls for the expenditure of more nervous energy than is the case in the treatment of adults. Parents do not, as a rule, take kindly to the suggestion that such services ought to be rewarded on the basis of the time spent. Hence a situation quite unsatisfactory both to operator and patient is presented. The dentist is required to spend time for which no reasonable compensation, except in rare instances, is offered, yet this work is important and must be attended to.

Disease of the first teeth is capable of producing lasting injury to the health of the child. Irregular eruption and unsightly malocclusion are often caused by the premature loss of the temporary teeth. Bone deformities, which often interfere with breathing, etc., may be the result of the neglect of the early teeth. Quite frequently we hear this question discussed by dentists. All are agreed that the need of the little folks for efficient dental care is vastly important, yet most confess to a lack of desire for this class of work. "Educate the parents to appreciate the value of our efforts," they say, "and we will then gladly do our part." Holders of this view may be charged with being imbued with the spirit of commercialism, yet all dentists cannot be philanthropists, in the sense that they can afford to give ten hours of professional service and receive therefor the pay of a street-sweeper.

The difficulties attendant upon dental treatment for children has of late been lessened a good deal, especially in the larger centres of population, where dental clinics have been introduced by munici-

palities and Boards of Education. In these clinics, where the expenses of operation are borne by the community, more time can be spent on this class of dentistry than would be possible in the case of one conducting a private practice.

Then there is the question of prophylactic treatment. An hour's time for treatment of an adult is, in most instances, not too liberal an allowance. On the basis of time spent, such treatment would call for a fee of, say, five to eight dollars. This might not be objected to in some instances. It would be a case of attempting professional suicide, however, for many dentists to follow such a schedule. All patients, even though recognizing the merits of the dentist's claim for a suitable fee, may not be in a position to pay it. Yet these patients may be in urgent need of dental treatment. In brief, then, the situation is this: There is a great and recognized need for service to be given children and adults of a type that involves the expenditure of much time as well as skill. The dentist has the skill, but cannot spare the time. How is the situation to be met?

A solution, or near solution, has been found in the introduction of the dental nurse or dental hygienist, a person with legal standing just recently introduced to the public by legal enactment in the State of New York. These nurses are permitted to practise to a limited extent, oral prophylactic measures. Commenting on the introduction of this new statute, the *Dental Register* says:

"There can be little question as to the necessity for these practitioners. There is a vast need, not only in our public schools, but children who are still too young to be in school, children in hospitals and institutions, and even hospital patients of every age can be cared for as by no other means at present available. The field is enormous, and it will take a long time to educate enough hygienists to take care of this public service, to say nothing of the work demanded in connection with private practices."

Aspirants for this new department must have had at least one year's attendance at high school, followed by one year's training in oral hygiene. This course of training may be taken at any dental dispensary or infirmary, legally incorporated and maintaining a proper standard and equipment.

There never has been much difficulty in securing assistants in the dental office because this sort of employment seems to appeal to many. There has always been, however, a lack of what may be termed "suitable" applicants. Few men have had the temerity to state what they consider to be desirable qualities in a dental nurse or assistant; at least no publication of such views are on file. Of unusual interest, therefore, is a paper by Carrie Johnson Wiley, published in the *Dental Pacific Gazette* (June) entitled "The Efficient Dental Nurse." Herein are stated some of the views held by a graduate nurse regarding the requisites of the efficient dental assist-

ant. This is the author's initial requirement:

"It is absolutely necessary that she try to create an attractive environment and thus display a tendency to eliminate the fears of the dental office or the sick room. Very often the bearing or demeanor of the nurse has been severely criticized by the clients of the office, and such a criticism has occasionally been just. We must bear in mind that too much reservedness on the part of a nurse is interpreted as haughtiness, indifference, or perhaps cold-bloodedness. The art of conversing pleasantly, gently, sympathetically, and yet in a non-committal tone is by no means an easy task. It is one which requires much thinking and is surely worthy of cultivation. Furthermore, we should remember that personal cleanliness, neatness, wholesomeness, and the capacity to meet requirements as they arise are the factors which engender confidence."

The writer is addressing an association of dental nurses and does not fail to caution them on that all-important subject—the nurse's personal attitude towards her employer. This is her way of treating this difficult topic:

"It (the nurse's attitude) should be becomingly respectful. I remember once hearing a nurse (a graduate of a recognized school) addressing the doctor as "Doc." I am sure that he did not know whether she meant a place in which to tie a boat, or whether she was speaking of a bob-tail horse. There is a vast difference between frankness and familiarity, and the nurse who has learned the difference has laid a good foundation for promoting harmony between her employer and herself."

There is such good sense in these remarks that one feels tempted to suggest that they receive a wide circulation among present and aspiring dental assistants. In doing this a splendid service would be rendered the profession, especially if the following paragraph from the same author's paper be included:

"A busy man cannot afford to give his time to trivial matters, nor to give thought to things which are far remote from his profession. One's personal affairs are most interesting to oneself. They may be endured by others, out of politeness, but oftentimes through force of circumstances their narrative brings about revelations which are afterwards regretted. Few people are criticized for talking too little; some of us are bubbling over with the enthusiasm of an interesting life, and it seems that we simply must express ourselves, but if we endeavor to think more and say less I am sure that some of our employers would be very thankful for the effort."

Then, again, a few views regarding the duties of the dental nurse:

"The nurse who realizes the importance of having a place for everything and everything in its place, who watches supplies like a hawk and detects inferior products or overcharges, who keeps each day's work up to its original standard, may feel that she is abso-

lutely essential to her employer. Surely not in an egotistical or self-satisfied way, but because he really needs her in the capacity of a nurse. Such a dental nurse is on the road to efficiency."

This is a pretty high standard, and it is to be hoped that some means may soon be devised whereby nurses of this type may become available.

COMMERCIALISM IN DENTISTRY.

Frequently writers in our dental journals grow enthusiastic in describing the efforts of a few practitioners who lay claim to uniqueness in that they do not hesitate to spend days or even weeks in performing operations ordinarily taking so many minutes or hours to complete. All the devices known to modern dentistry are requisitioned and made to pay tribute. Time and expense are obviously of little account, provided desirable results are obtained.

Such men are working under ideal conditions, we say, and we envy them this distinction. Seldom, if ever, are we advised as to the amount of their remuneration. This would be a mixing of the sublime with the ridiculous, and as such cannot be entertained. "There are no wealthy dentists"—such was often told us when we were students with a yearning to follow in the footsteps of the illustrious. "The only dentists who even approach the status of 'wealth' are those who have adopted unscrupulous methods in their practices"—this is a view that has even found expression in our dental literature.

The effect of such teachings—one is almost inclined to call them farcical teachings—is to engender in the minds of dentists a disregard for the monetary side of his labors. What a sad thing it is to see some members of our profession who, in their earlier years, gave unstintingly of their time and skill in advancing the cause of dentistry and are now without means of support. They are dependent upon others for a livelihood. A pitiful spectacle, we say, and yet it ought to serve as an object lesson. There are two sides even to a professional career—service and reward. One is just as important as the other.

Recognizing that a "laborer is worthy of his hire" it does not seem fair that we should charge as "commercial" those members of our profession who, while seeking new and better methods of dentistry, gather to themselves what is at best only a fair return for their labors. A dentist does not necessarily become "commercial" because of giving up his private practice to take part in the production of some article for the use of the profession. Such men deserve our help and sympathy and should not be discouraged by reason of our unjust censure. Dentistry needs, more than anything else, men who will do research work. Let us see that we survey the ground carefully before condemning any of our associates.

PREVENTIVE DENTISTRY.

A breezy, helpful little article occurs in *Dental Review* (June) by Dr. St. A. Chamberlain on methods to be employed in preventing dental ailments. The author, in reviewing briefly modern methods of dentistry, shows how it is possible, even under the best conditions, to cause areas about the tooth that will be possible source of subsequent infections. He holds to the view that the best dentistry is that which will prevent the loss of tooth tissue.

Taking into consideration the methods usually employed, the author shows how easy it is to bring undesirable conditions. In devitalization, if arsenic is used, the periapical tissues is attacked, its vitality is lowered, and it becomes susceptible to infection through the blood stream. If pressure anesthesia is used there is danger of infective material being forced through the apex. When treating putrescent root canals with strong drugs, the apical pericemental tissues suffer. The operation of filling root canals, unless free from sources of infection, will cause new troubles to occur later on. Crown and bridge work, either on vital or devitalized teeth, is attended with grave danger to the subject. In fact, no operation in dentistry, having in view the restoration of lost tissue, is above criticism. The best dentistry, then, is preventive rather than restorative in character.

Now for the author's suggestions for the prevention of dental ailments. First, the patient is instructed as to a course of home treatment. He is advised "to equip himself with a proper tooth brush, one with the bristles arranged in tufts, and the length of the bristles graduating from the short bristles at the end to long ones near the handle. Inasmuch as it is the end of the bristle which does the cleaning, none of them should be so long that they bend while sliding the brush over the teeth. Start the brush on the gums and with a rolling motion sweep down over the teeth." Young patients are instructed to use dental floss and older patients to use the flat floss for polishing between the teeth. A saponaceous tooth paste is to be used and followed by a vigorous rinsing of the mouth with lime water. In extreme cases of caries and denuded roots the mouth cavity is to be swabbed with a solution of Iodo-glycerol. "Iodin has great penetrating properties as well as germicidal properties, and will penetrate the mucous plaques as well as deposits of fermenting foods."

When the patient visits the office for treatment the first thing to do is to remove all calcareous deposits above and below the gingiva. The surfaces of the tooth are then polished with flower of pumice, using dental engine with cups and disks. Flat floss is used to polish the prominent surfaces "not only pass floss between the teeth, but polish the proximal surfaces carefully, flooding the field of operation. Finish and spray, using compressed air."

An abrasive, applied with engine polishing brushes, is then used on the sulci and pits. After drying the tooth, the pits and fissures are flooded with 20% Ag No₃ and worked in with a sharp explorer.

"This should be dried, and either white or black copper cement worked into all the crevices, leaving as much on the occlusal surface of the tooth as is possible without interfering with the occlusion. This cement will gradually wear away, leaving the fine lines still sealing the weak places for a long period of time, when the same can be repeated."

MULTUM IN PARVO

This Department is Edited by

C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

BURNING OUT WAX.—Wax in a casting investment should never be burnt out with a very hot flame, causing the melting wax to boil up through the sprue hole. Avoid this and you will have smoother castings.—*Robert J. Cruise, Chicago, Ill. (Dental Review).*

RENEWING ZINC.—When zinc that has been used for dies becomes thick and does not pour well, it is melted to dull red heat, and a tablespoonful of strong hydrochloric acid is added while stirring.—*Pacific Dental Gazette (Dental Cosmos).*

REMOVAL OF RUST FROM INSTRUMENTS.—The rusted instruments are laid in a solution of tin chlorid, preferably hot, and afterwards rinsed in clear water. Abrasives remove the polish.—*E. D. Spears, Journal American Medical Association (Dental Cosmos).*

STERILIZABLE WASHERS FOR HYPODERMIC SYRINGES.—Washers to be used on hypodermic syringes are easily made out of block tin of desired thickness and are far preferable to leather washers, as they are durable and can be boiled when necessary.—*M. M. Brown, Dental Digest (Dental Cosmos).*

INJECTING LOCAL ANÆSTHETIC INTO AN ABSCESS.—One should not inject the anæsthetic solution into an abscess, for by doing so the septic material and organisms may be forced from their comparatively benign location into the blood or lymph-stream and set up a similar pathological condition in other parts of the body.—*Dental Review.*

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Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

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ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

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A "Seasonable" Letter From One of the Editorial Staff.

[With the thermometer registering about 90 in the shade, the following letter arrived at the Editor's desk like a cool welcome breeze from the Northern wilds. Every dentist requires a period of midsummer rest and recreation if his greatest asset—his health—is to be preserved. Lock the office door and take that holiday you've been thinking about. It will repay you many times over, smooth out the kinks, and fit you for rendering better service to your patients upon your return.—EDITOR.]



Idyl Pynes, Georgian Bay,
July 18, 1916.

My Dear Doctor Seccombe:

I have been "a-goin'" to write you for a week, but have been so busy doing many things that my correspondence has been seriously neglected. I trust you are not suffering too much from the effects of Old Sol, as I hear none too good reports about his capers in our good city. We made a good journey to his northern home, and I assure you it was quite a relief to get your feet on the pine needles once more and get rid of all surplus clothing. Here I am at 9 a.m. with coat, collar and hat cast aside and feeling like a native, and my wife says looking even worse. I got out the first morning exactly with the sun and had the launch in commission before breakfast. That seemed to be too much of an effort and have not been guilty of such recklessness since. We found the cottage opened up and ready for us, and everything inside pretty well preserved. The only catastrophe of profound gravity was that a mouse made a comfortable nest in the waist-band of my fishing trousers—an unpardonable offence—and it has been "war to the death" ever since.

Haven't done much fishing as yet. Been too hot for success in that line. Still a little niece and I went out yesterday a.m. and she landed a fine chap—enough for dinner for six. I see she is writing her daddy a graphic account of it just now. I find plenty to do around the cottage. What with hunting enough to keep the household from being hungry and keeping things in order, I don't think there is much danger of getting too fat or lazy.

Most sincerely,

R. G. McLAUGHLIN.

Oral Hygiene Reports.

New York City, N.Y.—Nicholas Murray Butler, president of Columbia University, yesterday appealed for a fund of \$1,000,000, yielding an annual income of \$50,000, for the proposed dental school. Such an endowment will be necessary to found and maintain the school in conformity with the high standards set for it. A dispensary where treatment to the poor will be provided is planned in the school. The course will be four years, the first two identical with the medical course.

Long Island City.—Dr. J. Chester Haynes, assistant superintendent of St. John's Hospital, in Long Island City, has announced that on June 1 children living in Corona, Woodside and Astoria may have their teeth attended to free of charge. Dr. Haynes, in order to raise \$1,000 needed to buy instruments, has interested a number of wealthy residents of Astoria, who have promised to give the money.

Fargo, N.D.—At a meeting of the Commons Club, held at the Gardner Hotel, Fargo, resolutions were adopted authorizing the president to appoint a committee of three to draft a new law or amend the present state medical inspection law with a view of putting it before the State Legislature at its next session, in order to bring about compulsory oral hygiene in the public schools of the state, and that the club would lend its support to the Fargo School Board to promote better conditions of oral hygiene in the public schools of the city.

San Francisco, Cal.—In support of a campaign now carried on by the San Francisco Congress of Mothers for the establishment of free dental clinics in the public schools, a series of motion pictures will be shown in a number of theatres. The pictures show the urgent needs of the schools and the work already accomplished in Garfield and Visitation Schools, where dental chairs are now in operation. An appropriation of \$5,000 is provided in the next budget for dental purposes, and the Mothers' Congress will go before the Supervisors to urge its passage.

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No. 7

EDITORIAL

The Dental Hygienist and Preventive Dentistry.

THE movement to train young ladies to clean and polish the surfaces of teeth, and legalize their performance of this work, has met with some degree of favor in certain localities. This we believe to be a mistake and quite inimical to the best interests of the public and dental profession. In its support the sponsors for the movement claim the urgent need for oral cleanliness and a public requirement for services which cannot be supplied by the dental profession at the present time.

We must bear in mind that oral health means something more than the periodic visitation to a dental office for prophylactic treatment. Possibly the greater element entering into the prevention of dental diseases will be found to be the daily conduct of the individual concerning those habits of living that make for general health and the proper *daily* care of the mouth. Any movement that in any way tends to shift the responsibility for cleanliness from the individual to some other person—whether it be dentist or so-called hygienist—is decidedly a retrograde step.

People must be educated to take the necessary time to keep their

mouths clean and healthy. The ordinary individual realizes that he must keep his body in a clean and hygienic condition and quite willingly assumes the burden. And why not the mouth? Under modern conditions of living oral cleanliness has assumed a most important position. The technique of cleansing requires much more time than the average individual now gives to that task. A great many, through ignorance of the subject or through a lack of appreciation of its importance, neglect the hygiene of the mouth completely. The solution is public education and instruction—particularly in the schools. What the dentist needs more than the co-operation of the suggested professional hygienist is the co-operation of the individual patient. The dental hygienist idea might, however, appeal to the “idle rich”—if there be such—who may be too *idle* to clean their teeth and *rich* enough to pay the hygienist to perform that personal service.

We venture the opinion that if the individual give proper exercise and proper care to his teeth, he will require very little special prophylactic treatment, and, in the majority of cases, develop an immunity to dental disease.

If these young women are to give prophylactic treatment, including oral hygiene instruction, the examination of the mouth will be naturally included, and this in turn will naturally lead to the giving of advice. The patient will thus be deprived of the services of the dentist in some of the most important phases of dental practice. It seems almost incredible that there are those in the profession who, having regard to the best interests of their patients, would be satisfied to allow such conditions to obtain.

The oral hygienists of Connecticut recently held a convention, the programme of which, it was reported, “would do credit to any dental society, the principal address being delivered by Dr. F. C. Noyes upon the subject of the peridental membrane.” Some rapid progress (?). But how can prophylaxis be intelligently performed without a knowledge of the histology of the tooth and the surrounding parts. How can prophylaxis be intelligently performed without an intimate knowledge of dental anatomy and the many pathological conditions found in the mouth?

A young lady trained as an efficient assistant to the dentist in the operating room renders most valuable aid to the dental surgeon and increases output of service materially. In place of schools for dental hygienists, we should have schools for dental assistants, so that there might be available to every dentist a trained assistant who would be “an extra pair of hands,” and enable the dentist to better meet the demands that are made upon him. If dentists stopped puttering in the office over the hundreds of little things that could be better done by a trained assistant, there would be ample time for the more important services, namely, prophylaxis and instruction.

Canadian Dentists at the Front.

THE dental profession is greatly honored by its many members who have donned khaki. It is with feelings of pride that we remember those who have closed the office and given up comfort, home and friends that they might take their place in the world war for liberty and freedom from Prussian militarism. Canadian dentists represent the profession in the Dental Corps and other branches of active service in a most unselfish and heroic way.

British Dentist Honored by King.

FRANCIS MARK FARMER, member of the dental profession, England, was recently created a Knight, because of services rendered to the British War Office as a dental surgeon. Congratulations, Sir Francis.

Oral Hygiene Reports.

Boston, Mass.—An evening dental clinic is to be started by the Boston dispensary. An evening session has been decided upon on account of the great need of dental service to working people who cannot attend during the day.

San Francisco, Cal.—Dentists are to be in attendance at the public schools at the beginning of the next school term. The Board of Education has set aside the sum of \$3,000.00 to meet the expenses of a school dental clinic. Drs. Eggert and Hill have been appointed school dentists, with Miss Faville as assistant.

Macon, Ga.—At the recent meeting of the Georgia State Dental Society the plan was unanimously endorsed of having a bill introduced at the next session of the Legislature providing for the appointment of two dentists as State Dental Inspectors, their duties being to give regular and specified instruction to the school children of the state on the value and care of the teeth.

Washington, D.C.—The National Capitol Dental Society has filed a recommendation with the district commissioners that the latter include an estimate of \$5,000.00 in their next budget for the establishment of two dental clinics for school children. N. M. Dolmadge, chairman of the Oral Hygiene Committee, stated that seventeen states and thirty-two cities have free dental clinics for the poor, governmentally supported and connected with the school system. The Superintendent of Schools and the Board of Education have endorsed the proposed expenditure.

The Law of Habit

HABIT is simply a matter of mathematics. In other words, all that is necessary to get into the habit of doing a certain thing is to do it often enough. This law applies to good habits just as much as to bad ones.

To become a man of clean habits and strong, wholesome life, all one has to do is to keep doing clean, strong, wholesome things long enough. Of course, to do that is where the rub comes: but it will surely help a great deal to remember that the Creator put an instrument of good in our hand when He made that Law of Habit.

—Selected.



Lieut. Howard James MacLaurin
Winnipeg

Fell while bravely leading his men
in a charge to regain lost trenches
June fourteenth, Nineteen-sixteen

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

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No. 9

Health, Dental Science and Efficiency.

BY A CONTRIBUTOR.

IT is indeed praiseworthy that so much of time, investigation and effort has been expended by men of our profession to minimize the dental imperfections of humanity, and to reduce discomfort in connection with the restoratives of same. At the same time it is well not to fail to give the dentist himself due consideration.

Undoubtedly the man who is physically and mentally alert and capable is likely to render his best service, and so when due care is emphasized as incumbent upon the operator it is not wholly with selfish intent, but is quite directly for the benefit of his patients.

It is generally recognized that the expectation of life on the part of the dental profession is less than that of any other. The proportion who continue in harness till advanced years is remarkably small. The reasons are not difficult to point out. The sedentary employment, the strained positions, and the inhalation of impurities are physical reasons. Mentally, there is a strain of effort to do one's best when inflicting pain and discomfort, and the drain upon one's sympathies, and sometimes upon one's good nature, as the various temperaments of the afflicted are exhibited.

It is easy, therefore, to ascribe causes for the more rapid running down of the dentist's machinery, but not so easy it may be to suggest means of overcoming these conditions.

The object of these lines is to direct more attention to the preservation of one's health and comfort, and to see if there are not ways by which much of the harmful conditions can be ameliorated or relieved.

In these days when people are awaking to their needs as related to dentistry, and so much is being learned by our profession as to

ways and means as to prevention and cure, there is no doubt but that the sense of responsibility on our part is becoming more and more impressive, and it is hopeless to do, as individuals, all that is demanded in every phase of work. The call to this service can surely not be best fulfilled by plunging in heedlessly to accomplish the impossible, and thus doing ineffective and probably short-lived service. It is rather by deliberately selected and carefully executed work that of itself will stand effectively, leaving the operator better satisfied with himself, and bringing about as little as possible of that mental and physical exhaustion which renders his future effort less serviceable and shortens the period of his calling.

One of the ways in which the operator's life may be eased is by securing the confidence of his patient. If the latter can be duly impressed with the fact that you know your work (not by your telling him so, but by manner and action), if he can be brought to believe that you are giving every possible consideration to his good, then there comes that harmony that assists both to relax and be restful.

If such a feeling cannot be engendered it is often unwise to proceed at all. There are times when a barrier of antagonism seems to exist, and if it cannot be changed either at the time or in anticipation of a later sitting, then it is better for all concerned that a change in the operator should be made. It is true that there are some individuals that angels themselves could not associate comfortably with, but there is more often the fact that the lack of harmony exists when certain temperaments antagonize.

It is well for a dentist to so arrange his appointments that operations of the more exhausting character will not follow one another, and that so far as possible these should be undertaken during the hour of the day that finds him with energies alert and unimpaired.

The position of the operator is important. Fortunate is the man who is ambidextrous and is not confined to the necessity of so continuously retaining that posture that cramps the heart and brings too rapidly the stoop to the shoulders. Numbers of men use the mouth mirror and the angle hand-piece too little, and so are resorting to positions that involve unnecessary muscular strain.

The young man, not yet too rigidly confirmed to habit, should cultivate the use of an operating stool. It seems very difficult for an older practitioner to cultivate its use.

Outside of the direct relation to the patient, the surroundings of a dentist add largely to his comfort and his sense of ease in his work. So many of his hours are spent within his office walls, that so far as he is able his rooms should be bright, cheerful and comfortable. A sufficient number of rooms should be at his service to handle every phase of his work, and that of his staff, in a convenient manner.

His lady assistant should be instructed in such a way as to be capable of relieving him of very many of the business dealings with

his callers, and she should have an office with an equipment which would care for most of these calls, and also afford opportunity for all secretarial work. With such an assistant capable of bookkeeping, arranging appointments and looking after supplies, much of the laborious and often annoying effort is transferred to others.

The assistant at the chair can be made an important aid in relieving oneself of simple, but necessary details.

The appointments of the operating room should not necessarily be ostentatious or too manifold. Simplicity, with effectiveness, is more soothing to the patient and just as serviceable to the operator. The ready access to the needed article and an outfit which will most readily supply the applicable instrument will save in the end a remarkable amount of time and effort, and will facilitate the operation and enhance the patient's comfort.

Outside of his actual work, the dentist will find much of assistance, by the preservation of an open mind to the results of the labors of others as conveyed in publications or demonstrated at professional gatherings.

The pleasure of contact with our fraternity and the inspiration that each has the power to give, is always a delight, and surely gives a stimulus that is at once a relief from daily toil and an aid to future effort.

Grey hairs, or the lack of them, should not be an evidence of slipping down hill; but clearness of mind, steadiness of hand will be the gauge of a man's age and fitness; for in dentistry, surely, "a man is as old as he feels."

The number of hours in a day that should be engaged in labor is impossible of definite statement. The danger line should be carefully watched for and restrictions put on early.

The value of vacations, air, exercise, and good food, with sufficient time to properly eat it, need only to be mentioned to be recognized as important.

One thing that at first thought might seem contrary to the intent of this paper, but is really entirely in accord, is the real value of lending direct assistance to outside interests. At all times there are social, philanthropic and political interests that should appeal for our co-operation. At the present time there are the calls of patriotism, as evident in Patriotic, Red Cross and recruiting agencies. The response to such means not only definite assistance, but reacts on the worker to an extent that is very beneficial.

To sum up in a word, it may be said that the man who can bring about those conditions in self and surroundings, which will make work enjoyable and satisfying; who will know when to ease up and when to refrain, and will take advantage of the everyday opportunities for culture, social service and physical refreshment, will do the most beneficent service and live the most comfortable professional life.

The Importance of Correct Posture, with Especial Reference to the Use of the Feet.

C. STEWART WRIGHT, M.D., TORONTO.

[In this article Dr. Wright discusses a question seldom considered by the average dentist, and yet one of vital importance to every dental practitioner. It is generally recognized that members of the dental profession are particularly susceptible to foot-trouble and shoulder-stoop. Read Dr. Wright's article and endeavor to maintain "correct posture at the chair."—EDITOR.]

IN considering for a few minutes some points relative to the importance of correct posture, I believe we may, with advantage, start at the ground and work up, though I believe this topic usually conveys to the mind a consideration of the body only.

We will, therefore, direct our attention first to a consideration of the correct use of the feet. I may state at the outset that the great majority of people toe out too much. This is probably because, as a race, we have been taught to do so. Until recently our military and school drill taught us so, and the ordinary footwear is usually designed to influence us in that way.

All have heard the expression, "he is pigeon-toed," or "he walks like an Indian," derisively applied to one who assumed in walking or standing a posture which I hope to show more nearly approaches mechanical efficiency than does the attitude so commonly assumed.

The child who uses his feet with the intoe posture is constantly teased by other members of the family and constantly corrected by the parents. In fact, in my capacity as a surgeon, whose attention is largely devoted to dealing with deformities of various kinds, it is not infrequently that I am consulted by anxious parents about a child who happens to walk in this manner.

Since I have made this statement that most people toe out too much, I will endeavor to demonstrate why it is so.

In considering the use of the feet we will have to include a brief consideration of the knee and ankle joints as well as those of the foot proper.

As you know, the knee is a hinge joint having practically only a back and forward movement. The ankle joint is similar, having only a back and forward movement. The next point of movement of any appreciable degree in the use of the foot is at the metatarsophalangeal joint, or where the toes join the foot, and these again are in the same plane with a back and forward movement only. It will be further noted that this small row of joints from within outward

angle backward about 20 degrees from a straight line or corresponding to the usual wrinkle of the shoe at that point. With these three sets of joints acting in the same plane and having the same type of motion, it follows that they would act in nearly a straight line, and properly used, they do.

Now it will be found that if the foot is placed gently down, and the knee and ankle bent as in the act of walking, if it is performed with the greatest ease and without strain or twist of the knee or ankle, the knee will or should fall directly over the great toe (charging).

At the same time all the toe joints are brought into use in bending the foot further forward, each bearing its portion and assisting in distributing the weight.

Now if we grant, and we must from an anatomical study of these joints, that to avoid strain they should be used in this way, it follows that if the feet are everted or turned out and in the act of walking one adheres to correct principles as regards the use of the knee, ankle and toe joints, then progress must be made by a zigzag course, which would be very awkward indeed.

But you will say people do not walk that way even though the feet are turned out considerably. Then how is the appearance overcome. First, by a little twisting and strain at the knee, a little more on the ankle, next on the arch of the foot; then instead of bending on the five toes all the weight of progression in the foot is carried on the great toe joint, instead of being evenly distributed over the five toes, and the general line of weight bearing, which is in line with the shin bone, is carried to the inner side of the foot instead of to its centre.

This results in a constant overwork and injury of the great toe joint, and is the greatest single factor in producing the ever present bunion, or at least an enlarged and tender joint. It effects a weakening of the ankle and overstrain and breaking down of the long arch of the foot, producing flat foot and sometimes weak and painful knees. Some very stout individuals who are entirely unable to stand this modified strain do actually assume the zigzag gait mentioned above, and I am sure every one has observed this gait on the street.

In different individuals there may be great variations in the amount of suffering sustained in the different joints; quite frequently painful knees may be entirely relieved by adopting a correct use of the feet.

The most frequent location for suffering, however, is in the long arch, due to overstrain and the production of flat feet.

However, this is a problem which involves more than the consideration of the detrimental influence on individual joints and muscles, but it is relative to the whole question of the conservation of

the energy and the maintenance of the posture of the body as a whole. Not only do the immediate joints suffer, but as a consequence the whole organism.

The lassitude and fatigue experienced by many after moderate exertion, or after a walk which ordinarily should result in improved vigor, may often be traced to such an attitude in the use of the feet as that described.

Backache, headache and other suffering often result from such a waste of the available energy, for no part of a machine so delicately adjusted as the human body can be allowed to go wrong without the whole organism suffering.

If, then, there are such disadvantages in the position described, what is the correct position. To help us determine that I wish to go to nature for assistance. The young child, before its feet have been influenced by shoes, walks with the foot in a straight line. The Indian, in the original state, as you know, held the feet in a straight line or slightly inward.

Now, if instead of holding the foot turned out as mentioned, we bring it into a straight line ahead, it will be observed that when the knee and ankle bend they do so with the least effort; the five toes bend in the motion of the foot, and the line of weight bearing falls directly through the centre.

This leads us to a consideration of the importance of correct posture of the body. Raise the chest just as high as possible without raising the shoulders. Make an effort, in fact, to hold the shoulders down. Do not throw the shoulders back or make any effort to draw the abdomen in, simply raise the chest and the result will bring the spinal column into position and raise all the vital organs to their normal height.

I do wish, however to point out that due attention to the facts presented regarding the correct use of the feet will have a very important bearing upon the ease with which one will assume and maintain a correct posture of the body. Certainly, if the foundation is at fault the superstructure must suffer.

GERMAN DENTISTS AND THE WAR.—About 1,400 German dentists have been summoned for war service up to October, 1915. Of this number, 900 are among the first line troops serving as soldiers or officers. About 500 are doing dental or medical duty in hospitals, and of these again more than 300 are assigned to field and base hospitals, while some 180 are giving dental service in their home cities. Up to October, 1914, 130 dentists had been killed in action, while considerably more than eighty were wounded and eleven made prisoners.—*Oesterverchisch, Ungarische, Vierteljahrsschrift für Zahnherlkunder, per Dental Cosmos.*

The Microscopic Examination of Finger Nail Deposits.

Significance in Forensic Medicine and in Public and Personal Hygiene.

ALBERT SCHNEIDER, PH.D., M.D., SAN FRANCISCO.

[The danger of infection from finger nail deposits is clearly shown by Dr. Schneider. The subject is of special interest to the practising dentist. No thoughtful man could read the article without appreciating the importance of giving particular care to the cleansing of the hands and special attention to the condition of the finger nails.—EDITOR.]

THE microscopic examination of the deposits under the finger nails promises to be of importance in forensic medicine and also in certain phases of public sanitation and personal hygiene. This form of examination has been known for some time, and has been practically applied in a number of criminal cases both in this country and in Europe, but so far it has not been adopted as an officially recognized routine in the examination of criminals or those suspected or accused of having committed certain crimes. The possibilities of this procedure became apparent to me over twenty-five years ago when incidentally examining the scrapings from my own finger nails and those of my laboratory assistants. The number and variety of substances found was astonishing. Since that time the microscopic examination of finger nail deposits has been made a laboratory exercise for students in connection with the study of fiber and of body cells and bacteria.

This particular exercise was at first sandwiched in as a diversion rather than a part of the regular course. Each student of a class of forty or fifty was requested to mount the scrapings from the nails of the second and third fingers of the right hand (in case of right handed persons) on a slide in a drop of water and to examine this carefully under the high power (450 diameters) of the compound microscope. The findings proved interesting and not infrequently astonishing to the student. The most important part of this laboratory exercise was the interpretation of the findings. The findings gave evidence of the routine labors engaged in for periods of from one to eight days previous, and of the personal habits, of the kind and quality of clothing worn, of business occupations, etc.

It was found that there was a very notable difference in the contents of the deposits of the nails of the right and left hands, and also in the deposits of the nails of fingers and thumb of the same hand. Numerous examinations proved that the ordinary methods of clean-

ing the hands by means of soap, hot water and clean towel, inclusive of the usual nail trimming and polishing, as observed by persons of clean and sanitary habits, does not materially alter the microscopic findings; in other words, the usual hand toilet operations do not clean the hands and certainly do not cleanse the inner surface of the free ends of the finger nails. Even the vigorous use of the nail brush with soap and hot water does not result in a removal of all the deposits. Of far greater influence is the habitual close trimming of the finger nails as observed by some persons. If the nails are regularly trimmed very close, to the point of nearly causing bleeding, very little deposit of any kind will find lodgment. This practice is rare, however, and may be considered the exception to the rule.

The bacteriologic findings of the finger nail deposits are also very interesting. The streptococcus group apparently predominates in most persons, rather than the staphylococcus or the colon bacillus group, as one might reasonably expect. The organisms found in the rather limited number of cases (143) examined predominate in the following order:

1. Streptococcus group, the acid fats varieties predominating.
2. Staphylococcus group.
3. *Bacillus coli* group, almost invariably present.
4. Bacilli, cocci and spirillae probably derived from mouth, soil, food, water, body surface, nose, eyes, sewage, dust, dirt, etc.
5. Occasional yeast cells, spores and filaments of higher fungi.
6. Larvae of vermes; occasional amebas; diatoms, algae; etc.

From the medicolegal standpoint, the examination of nail deposits will prove of greatest value in those criminal acts in which great violence is employed, as in murder, physical encounters of all kinds, and rape or attempted rape. In such cases it would be desirable to examine the nail deposits of both the accused and the accuser, for as is known, persons are not infrequently falsely accused, and particularly is this true in charges of rape or attempted rape. For example, scratches and other skin abrasions on hands and face of the accused should reveal skin epithelium, dermal fragments, blood corpuscles and possibly hair fragments of the accused in the nail deposits of the victim. If such findings proved wholly negative, especially in the absence of marked injury to the genitalia of the accuser, it would point to either false accusation or perhaps voluntary submission. Valuable evidence may also be obtained in other criminal acts. A husband was accused of having induced his wife to submit to the performance of criminal abortion and to have disposed of the fetus. The examination of the husband's finger nail deposits revealed a number of frustules of fresh water diatoms and a few filaments of oscillaria which led to the suspicion that he had buried the fetus in some marshy soil. Careful search along the marshy edge of a nearby stream revealed no newly-made grave, but a slightly scooped out

depression in the edge of the stream itself proved to be the burial place, and on digging disclosed the nearly full term fetus.

Efficiency in the line of investigation suggested above depends on long experience in micro-analytic work and on a wide range of microscopic study of all kinds of substances, animal, vegetable and mineral. The time required to qualify as expert in this line would vary, depending on personal differences; but in all probability the requisite experience, in addition to the necessary educational preparation, such as medical course, university course, special college course, etc., could not be attained in less than ten years of constant application.

In medicolegal cases the nail deposits should be taken in the presence of the chief of police, if possible. In some cases it may be desirable and necessary to take the nail deposits on the spot, and the analyst must therefore be vested with the necessary police authority to call to his assistance any police officer that may be available. The deposits should be examined immediately, if possible, in a laboratory supplied with the necessary apparatus and chemical reagents. There must be on hand suitable report blanks on which the findings are to be recorded in ink or by means of an indelible pencil.

After the examination is completed, the findings should be summarized and interpreted. The greatest care must be observed in the interpretation of the results of the examination. The analyst must qualify as an expert and he must be free from all bias, and in no case must he allow prejudice to influence him in any manner whatsoever. When called on to give an opinion, he must be able to speak as one who knows, and he must cast aside all prejudice both as to the scientific and moral principles which may be involved and as to the persons or personalities implicated. At no time must he allow himself to be in any way influenced by the opinions expressed by any member or members of the police force with whom he is of necessity associated.

Thus far the medical profession has given little attention to the part played by the finger nail deposits in the transmission of infections. That there is danger in the handshake is generally recognized and admitted by the laity as well as the medical fraternity, but so far there is no effort made to do away with this ancient custom. There are certain persons who refuse to shake hands or who do so under mental protest. The Chinese do not shake hands with each other, but perform this ceremony by shaking hands with themselves.

The chief source of danger in the handshake is in the deposits under the finger nails rather than in the hand and fingers. The more important infections traceable to the finger nail deposits may be divided into two groups as follows:

1. Autoinfections.—There is no doubt that many skin diseases are traceable to scratching. Of such nail borne autoinfections we may mention lupus, acne, boils and carbuncles, and septicemia. In this

manner infections are carried to nose, to eyes, to ears and to mouth and throat. Skin infections are transferred from one part of the body to another by the scratching and skin picking habit or by constantly "digging" or "picking" at a sore spot, and as a result some persons are never quite free from boils and acneic eruptions, particularly persons with low opsonic indexes to the causative infections. Infants and young children are constantly picking up infections with their finger nails and transferring these to the mouth, nose, throat and eyes. Nail biters very frequently infect themselves through the materials under the nails. Children and some women have the habit of bringing the fingers to the mouth, thus favoring the transfer of infecting material from finger nails to mouth.

2. Heteroinfections.—In many cases the infection is traceable to the finger nail deposits of others, as by handshaking, stroking or caressing the head or face, etc. There is the case of the husband whose neck on the left side was never long free from one or more small pimples or boils traceable to his wife's habit of playfully pinching his neck. He ascribed the trouble to starched collars, but several changes in the laundry brought no relief. During the prolonged absence of his wife on a visit with relatives, the trouble disappeared entirely to reappear again on her return with a renewal of the playful habits.

It certainly requires no lengthy argumentation to prove that there is danger in the finger nail deposits. Most valuable information could no doubt be obtained through a careful microscopic and bacteriologic investigation of the nail deposits of the different classes and races of people. Such information would be of inestimable value to physicians, to sanitarians and to the public in general. Furthermore, the occasional if not routine examination of finger nail deposits of patients would frequently give the attending physician valuable information regarding the source of the causative infections and personal habits which might have bearing on the disease.

This brief outline of a very important as well as interesting subject will, it is hoped, serve as a stimulus to others for making additional observations and investigations along the lines indicated.—*The Journal of the American Medical Association*.

SAVING TIME IN MAKING PLASTER CASTS.—A strip of cardboard bent around the impression, with the two overlapping ends pinned together, produces a beautifully finished cast and saves a great deal of time otherwise consumed in trimming the cast. The cardboard can be cut to any width according to the desired thickness of the cast. After the plaster cast has been poured the plaster is levelled off to the margins of the cardboard, which is removed when the plaster has sufficiently set, producing a very pleasing result in regard to smoothness of the cast.—*Dental Cosmos*.

Report of the Free Dental Dispensary, Poughkeepsie, N.Y.

STEPHEN PALMER, D.D.S., CHAIRMAN OF DISPENSARY
COMMITTEE.

AS Chairman of the Free Dental Dispensary Committee of the Poughkeepsie Institute of Dentistry, I submit herewith the first report of the Dispensary, including the activities since its opening one month and a half ago, and also a short resume of the history from its inception.

“There is not one single thing more important to the public, in the whole range of hygiene, than the hygiene of the mouth.”

This assertion and many others just as convincing, made by such eminent English and American surgeons as Doctors Hunter, Osler, Mayo and Vaughan, brought to the attention of educators and medical men the truths that the dental practitioner has been advocating for years—That on the cleanliness of the mouth and teeth depends the health of the body. It needed just a word from surgeons of renown to kindle the flame which has burned in the minds and hearts of educators and dentists, until to-day, many dental dispensaries are being established in cities and towns of foreign countries as well as our own. Philanthropists are giving of their wealth to establish them, and dentists of their time to endeavor to convince educational and city administrative boards of the necessity of free dispensaries in the schools, and also to lecture to the pupils along the line of proper care of the mouth—the gateway of the body.

It was three years ago, after much discussion, that the members of the Board of Education and a majority of the ethical dental practitioners of the city met at dinner, having as their guest, Dr. William A. White, then oral hygiene lecturer of the New York State Board of Health, who, with others endeavored to make clear to the members of the board the necessity of, and the advantage gained, by the establishment of a dispensary in our schools. At that time Dr. White talked at nearly every school in the city, accompanied by our present superintendent of schools, who, although convinced, saw the need of a dental dispensary more than ever, and from that time until this, it has been years of continual activity, until to-day we have a dispensary, equipped with the most modern outfit and a salaried operator and attendant, on duty four hours each day during the school year, relieving the suffering and preserving teeth that otherwise would be beyond usefulness on account of decay, which would eventually lead to bodily disease, and finally, undeveloped boys and girls and sickly men and women.

On October 9 of this year the dispensary was opened with a public reception and meeting in the School Administration Building, on Washington Street, when addresses were made by Dr. Harold D. Cross, of the Forsyth Infirmary of Boston, Massachusetts, Professor Sylvester R. Shear, Superintendent of Schools, and others.

The dispensary was made possible by the co-operating of the Board of Education and the eleven dentists of the city, composing the membership of the City Dental Society. It is under the control of both bodies, from which committees are appointed to supervise its management, and it is carried on for the immediate benefit of the needy boys and girls, and we believe it will be the means of advancing their education, as it is a world-wide opinion that teeth, both temporary and permanent, are the most essential factors in the promotion of health and intelligence of the child, and upon their care and condition depend their strength and educational ability, as a large percentage of retardation in the schools is traced to imperfect and neglected dentition.

In the equipment of the dispensary there is a set of cards which are used for reference and investigation, as there is an age limit of the eligibility of the applicant, and a limit to the income of families, from which they may be received and treated, as in this way only the needy can be cared for, and those unworthy eliminated. Also a set for keeping an accurate record of all operations performed, and for the sake of the future of the child, notices are sent them at stated times that they may visit the dispensary for prophylactic treatment and examination, thus preventing a recurrence of the deplorable condition found in many mouths. *Prevention rather than cure*, is the motto of modern dentistry and medicine.

The future work of the dispensary is not to be relief and restoration only, but rather educational, as the attending operator and assistant are expected to so instruct every applicant, that when they are dismissed they will know the value of a clean and well kept mouth and teeth, and how to keep them so. There is also a little booklet, "The Poughkeepsie Dental Dispensary," compiled by the writer, which is handed to each applicant as he leaves the room, setting forth many important truths for the child and parent.

Since the opening of the dispensary to the closing of the schools for the holiday recess it has been in operation two hundred and one hours, with the following result:

Fifty-one applicants, from all grades in the schools below the High School.

Seventy-one extractions consisting only of temporary teeth, excepting eight, which owing to the average age (nine years) of the applicants (the period when the greatest number of permanent six-year molars, are found in a badly carious and broken down condi-

tion) shows that many of these important teeth are restored to usefulness.

One hundred and sixty-three treatments, including treatments for relieving pain, devitalization of pulps, and treatment of abscesses.

Three hundred and thirty-five fillings, which includes removal of nerves and filling of root canals, and the insertion of cement and amalgam fillings.

Twenty-seven prophylactic treatments (every patient is given this treatment before being dismissed).

Three radiographs have been taken for cases needing such, to determine the condition of the roots of the teeth, and jaws.

Many cases have been referred by the dispensary operator to practitioners of the city who are always willing to assist in every way, to advance the cause, believing that from the result of the work done in the dispensary many of the boys and girls will be inspired to keep on with their studies. Many will be able to be more regular in attendance at their classes, as without good teeth and clean mouth a child cannot masticate its food properly. Without proper mastication there cannot be proper digestion, without proper digestion there will be poor and unhealthful assimilation, and as upon proper assimilation depends the strength and health of our boys and girls and the future men and women, we believe we are building for a stronger and healthier coming generation.

It is the ambition of the promoters of this enterprise to carry on the propaganda of oral hygiene and prophylaxis until every city and town shall have a school dental examiner, a free dental dispensary, and operator and nurse in attendance in every school building, and every pupil in the public schools of the land will be given a text-book on oral hygiene, and be taught the importance of the care of the mouth and teeth. May the day speedily come when our ideals may be realized.

Speaking for the Dental Society, as chairman of the Dispensary Committee, every member is enthusiastic, and willing to assist in promoting the cause, which we believe to be one of the greatest, if not *the* greatest, agents for the improvement of the health of our city, and as a society we appreciate most heartily the interest and support given us by Superintendent Shear, President Rust and the Board of Education as a whole, in the establishment and conducting of the dispensary which places Poughkeepsie in the class with larger cities of our state and nation.

"The care of the teeth in the public schools is the foundation of the health of the nation," so says the president of the International Hygiene Congress, and let to that be added: There is no single factor that so impoverishes a community as disease, and there is no single factor that so greatly predisposes disease as bad teeth and bad oral hygiene.

Septic Teeth.

BY JOHN SAYRE MARSHALL, M.D., Sc.D., F.A.C.S., CAPTAIN,
U. S. ARMY, RETIRED.

THE subject of this paper is one that is being much discussed at the present time. The seriousness and importance of the subject will, we are sure, be admitted by all who have given it thoughtful attention.

Suppurative and septic conditions of the mouth are exceedingly common and are, in a large majority of cases, associated with the teeth. The statement has been frequently made, and the fact is generally recognized, that dental disorders are the most common of all diseases that afflict the human race, and that many diseases of obscure origin affecting the general system,—such as chronic dyspepsia, gastritis, gastro-enteritis, chole-cystitis, nephritis, diabetes, and certain nervous affections, tonsillar diseases, pharyngitis, bronchial and pulmonary affections, certain diseases of the eye and ear, and general septic conditions, such as septicemia and pyemia, etc., may often be traced to an infection from a septic oral cavity.

A septic oral cavity is generally, if not always, the result of neglectful habits due, usually, to ignorance of the dangers to health and life that surround such conditions. Neglected dental plates, bridges and crowns, faulty fillings, deposits of decomposing food debris, salivary calculus, dental caries, gangrenous dental pulps, acute and chronic dento-alveolar abscesses, pyorrhea alveolaris, gingivitis and stomatitis in their various forms are all active factors in producing a septic mouth.

Dental surgeons have been trying for years to impress this fact upon their patients, and upon the medical profession generally, but their efforts have usually fallen upon indifferent or deaf ears. With a few notable exceptions they have, until quite recently, made but few converts among medical men. These gentlemen, as a rule, have looked askance at any opinion upon a medical or surgical subject coming from a dental surgeon; saying in some instances that it would be better "the shoemaker should stick to his last!" This attitude has doubtless retarded an earlier and more just conception of oral sepsis as an ever-present menace to individual health.

The subject of oral sepsis is one of vast importance from the public health standpoint also; it is not second to any other that concerns the physical and mental welfare of the people; for it strikes at the very foundations of the race in that 75 to 95 per cent. of all public school children are suffering from it,* and as yet no adequate measures have been put in operation to cure the evil or arrest its progress.

*See (1) Bibliography.

It is very evident that the profession, and the public generally are not fully awake to the seriousness of the problem, nor to their individual and collective responsibility in the matter, for, if they were, the conditions would soon be corrected.

The introduction of vaccination against smallpox has almost driven this disease from the face of the civilized portions of the earth. Great efforts are being made to stamp out the scourge of tuberculosis. Much has been done to prevent cholera, diphtheria, tetanus, rabies, yellow fever, typhoid fever, cerebro-spinal meningitis, etc., but practically very little has been done to rescue the 95% of school children from the dangers of oral sepsis.

That the dangers to health from oral sepsis are very great no one will deny; but there is at the present time a tendency upon the part of many medical men to over-estimate this danger, and to ascribe to oral sepsis a greater pathologic importance than it deserves. Not that septic teeth are not a grave menace to the general health, but that we are liable to overlook the fact that the oral cavity is *not the only* location of septic foci.

There are many other diseased areas which may furnish foci of infection equally grave; for instance, chronic appendicitis, abscess of the kidney, of the liver, infections of the gall-bladder, the pancreas, the Fallopian tubes, the maxillary sinus, the frontal sinus, the accessory sinuses, etc., etc. These conditions, however, are much more rare than are septic foci of the oral cavity; but the possibility of their presence should not be overlooked. That they *are* frequently overlooked and the teeth made to act the part of the scape-goat, there is no denying.

This is shown by the fact that many medical men are insisting that their patients shall have all teeth extracted that show any signs of suppuration, regardless of the probability that many of these teeth can be saved by appropriate dental treatment. Are not some of us allowing ourselves to be carried by the popular wave too far afield, and away from the safe, common-sense, well-beaten track of a wise conservatism?

That the difficulties in locating the particular focus of infection in any given case of systemic disease are many, there is no gainsaying. This calls for special knowledge in many subjects, and few men are so gifted in all departments of medical science as to be able to dispense with the services and knowledge of the trained specialist.

Dr. Frank Billings,* of Chicago, in speaking of the difficulties of locating the various foci of infection, and establishing the character of the micro-organisms present, says, "This requires team-work of the clinical and laboratory workers. The clinician must carefully examine the patient, exhausting every detail of the personal history. The skill of the dentist, the nose and throat specialist, the gynecologist,

*See (2) Bibliography.

the genito-urinary expert, and others, may be necessary to locate the foci of infection. The foci must be destroyed. Tissues and exudates of foci should be carefully examined, and bacterial cultures made."

Professor Osler,† in a recent address to the students of the Royal Dental Hospital of London, said, "You have just one gospel to preach, and you have got to preach it early, and you have got to preach it late, in season and out of season. It is the gospel of the cleanliness of the mouth; cleanliness of the teeth; cleanliness of the throat. These three things must be your text through life."

"Oral hygiene—the hygiene of the mouth—there is not one single thing more important to the public in the whole range of hygiene than that; and it is with that which you, as practitioners, will have to deal."

Professor Osler has also placed himself on record in relation to the serious effects of dental and oral disease upon the general health by saying, "If I were called upon to state which, in my opinion, caused the most evil—alcohol or decayed teeth—I should unhesitatingly say decayed teeth."

To Dr. William Hunter‡ of the London Fever Hospital belongs the credit of being first to arouse the medical profession to a realizing sense of the great dangers to individual and public health from oral sepsis, by the publication in the *London Practitioner* of his researches and personal experiences upon this subject. Let me quote just a few of the pregnant sentences in his introduction:

"For the last twelve years, in connection with various studies, my attention has been called in increasing degree to an important prevalent source of disease; one whose importance, I think, is not sufficiently recognized. The source is *oral sepsis*—sepsis arising in connection with diseased conditions of the mouth. My attention," he says, "was first drawn to it in connection with the pathology of anemia; and since then it has been extended in connection with the pathology of a *great number of infective diseases* which have one factor in common, viz.—septic organisms underlying them."

In a later communication,* he shocked the dental world by his criticism of many of the dental operations now performed, because of their unsanitary and unhygienic methods of procedure or construction; and the retention in the mouth of many diseased teeth and suppurating roots, which it would have been better to have extracted and so have eliminated the source of infection.

The difficulty with Dr. Hunter's criticism was that he arraigned the whole profession, for he made no distinction between the honest, scientific dentistry performed by the better class of practitioners, and the dishonest, unscientific, slovenly dentistry practiced by the quacks.

†See (3) Bibliography.

‡See (4) Bibliography.

*See (5) Bibliography.

What he said about the latter was eminently true and just; but when applied to the honorable, conscientious dentist was eminently untrue and unjust, as every fair-minded medical practitioner must admit. It was this criticism which has been taken up by many medical men without proper investigation, that has brought about this desire for the wholesale extraction of all diseased teeth, regardless of the possibility or the probability of their being rendered healthy and indefinitely useful by proper dental treatment.

In no portion of the human body can there be found in so small a space so many individual organs that are each capable of becoming the seat or focus of a septic infection as in the oral cavity. This cavity usually contains thirty-two teeth, each one of which may, under favoring conditions of disease, at some time or other, become the focus of a septic infection.

But this possible number of septic foci may be greatly increased by reason of the fact that many of the teeth have multiple roots, and each root may become a separate focus. The superior molars have each three roots, and the inferior molars two, while the superior first bicuspid often have dual roots. Hence, figuring upon this basis, there would be fifty-four individual locations where septic foci might, under favoring pathologic conditions, be established. This does not take into account the large area of mucous surface which covers the lips, cheeks and gums, nor the very extensive area of pericementum which may become the seat of septic inflammation in gingivitis, stomatitis and pyorrhea alveolaris.

Dr. Charles H. Mayo† in a recent address before the Section on Stomatology of the American Medical Association called attention to the fact that "A comparatively small number of infections occur through wounds of the cutaneous surface. * * * Infections which produce the greatest number of diseases enter the system by way of the alimentary and respiratory tracts. Somewhere in the line, then, of the alimentary and respiratory tracts and in the excretory ducts of the body lie the sources of the entrance of organisms which terminate life in the majority of instances.

The great importance of the well-known diseases of the nasal passages with their sinuses, the lymphoid tissue of the pharynx, including the tonsils, and the diseases of the gums and the teeth, which have been given prominence by the dental profession during the last three years, is now more generally appreciated."

Rosenow says,* "While the most common location of the focus in various infections is probably in the head, it may be located elsewhere. Thus, in two cases of typical rheumatism, we succeeded in isolating the *Streptococcus rheumaticus* from the stool; in one from an infected ingrowing toe-nail, and in another case from the wound in the thumb following a crushing injury."

†See (6) Bibliography.

*See (7) Bibliography.

Billings and Rosenow have repeatedly emphasized the fact that the oral cavity is the most prolific source of focal infection, and yet they place the tonsils at the head of the list. In this, I believe, they have over-estimated the tonsils as a source of focal infections, for there is no doubt in my own mind that the tonsils usually receive their primary septic infections from the mouth and the teeth.

No one knows better than the dentist, the oral surgeon and the nose and throat specialist that, with the ordinary individual, the mouth is the most filthy cavity of the human body, reeking with decomposing food debris, and millions upon millions of bacteria of saprophytic and pathogenic character.

Is it any wonder, then, that the tonsils should so frequently be the seat of septic inflammations?

Tonsilitis is rarely seen in connection with a clean, well-kept hygienic mouth.

SEPTIC TEETH.

By septic teeth, we mean all teeth in which by disease or traumatism pulp vitality has been lost. These teeth are in a septic condition by reason of the putrefaction of the devitalized pulp remaining in the pulp-chamber and root canals. Or, by the decomposition of the organic material of the dentine—namely, the dental tubuli and fibrillæ, in teeth which have not been properly sterilized and the root-canals hermetically sealed.

Every devitalized tooth which has not been properly sterilized and the root-canal hermetically sealed from its apical foramen to and including the break in the continuity of the dentin and enamel, whether it be from a cavity of decay, or a surgical traumatism made to gain access to the pulp chamber and canal, is liable sooner or later to become the seat of a septic infection.

This statement cannot be successfully controverted.

Teeth which are affected with pyorrhea alveolaris are also septic, from suppuration in the alveoli, and are a source of grave danger to the general health; but their consideration at this time would unduly prolong the limits of the paper, and must therefore be excluded.

We shall confine our discussion at this time to devitalized teeth—to be more explicit—to those teeth which have lost their pulp vitality, and are in a septic condition.

Some years ago it was my pleasure to make an extended series of examinations of extracted, devitalized teeth, the roots of which had been filled, and the apical foramen sealed—perfectly—so far as the unaided eye could detect. These teeth, upon being split open in a longitudinal direction, gave in nearly every instance unmistakable evidence of being in a septic condition, by the intolerable odor of decomposing organic matter. The only cases in which this odor was not present were in those devitalized teeth the root-canals of which had been filled with iodoform cotton. These teeth, however, in nearly

every instance showed signs of inflammatory processes at the apices of their roots. The odor of decomposition had, however, been covered up by the greater mal-odor of the iodoform.

It is estimated that the dentine contains about 28% of organic matter which—after the devitalization of the pulp—rapidly takes on putrefactive changes, with the generation of mephitic gases and bacterial poisons, unless the tissues have been thoroughly sterilized.

The teeth have two sources of blood-supply and enervation, namely, through the pulp, and through the pericementum. The pulp is the vascular and enervating organ, and gives to the dentine its nutrition and sensation, while the pericementum performs the same office for the cementum and the structures of the dento-alveolar joint.

The loss of pulp vitality does not necessarily mean the complete death or necrosis of the tooth, for so long as the pericementum continues to perform its functions, a pulpless tooth may remain in the jaw for an indefinite period. It is, however, more liable to be attacked by dental caries than with teeth, and infinitely more susceptible to traumatic injuries and septic infections, by reason of its loss of vital resistance in the tissues supplied by the pulp with nutrition.

These facts, though well known to the profession, have often been overlooked, or entirely ignored, by many reputable dental practitioners, and pulps needlessly and ruthlessly destroyed for the purpose of inserting crowns and bridges, where fillings and plates would have been a *better* and *more conservative* practice. Worse than this, however, has been the practice of many so-called dentists—quacks—who, for a few paltry dollars, have been willing to jeopardize the health and life of their clients by placing crowns and bridges upon the roots of teeth so diseased that they were entirely beyond the pale of successful treatment; no effort being made to sterilize the canals, or fill them, except by a carbolic acid dressing covered with oxy-phosphate cement or gutta-percha.

The successful treatment of pulpless teeth calls for a high degree of technical knowledge in the fields of dental anatomy, histology, pathology, bacteriology and therapeutics; while the surgical and manipulative skill required to successfully fill the root-canals of such teeth must be of the very highest order. There is no operation, to my knowledge, performed by the general surgeon, or any specialist connected therewith, that can compare with this in the anatomical difficulties to be overcome; the minuteness of the area to be operated upon; the delicacy of the instruments employed; or the skill required for its performance.

Medical men are sometimes inclined to harshly criticise the dental surgeon for his failures in treating pulpless teeth. The failures are many, we admit, but he should be commended for the measure of success he achieves against such odds, and his failures, when they occur, condoned.

As soon as a pulp is exposed by caries, or loses its vitality by traumatism, the pyogenic organisms attack it in the first instance, and the saprophytic germs in the second; and putrefaction and liquefaction of the necrosed tissue takes place. At this time, the predominant micro-organism present is the *bacillus gangrenae pulpae* of Arkory, an exceedingly virulent organism, as you would soon learn if you should be so unfortunate as to wound a finger with an instrument that had been in recent contact with such a pulp.

Another organism which is frequently found in the canals of pulpless teeth and in apical abscesses is the *streptococcus viridans*. This organism is usually the dominant factor in the production of systemic diseases, such as malignant endocarditis, chronic arthritis and myositis. (Billings).*

The dominant organisms according to Billings,† found in infected alveoli and tooth canals belong to the *streptococcus-pneumococcus* group.

This investigator further says: "Systemic disease due to a focus of infection anywhere is probably always hematogenous." "Local hemorrhage and endo-arterial proliferation result in interstitial overgrowth, cartilaginous, osseous, vegetative and other anatomical changes, dependent on the character of the tissue involved." He further thinks it susceptible of proof that a "chronic alveolar infection, and chronic infections in other regions also, may cause systemic disease by hematogenous bacterial emboli, which infect, and at the same time *deprive the tissues of nourishment*. Local infection of muscles, joint tissues, etc., and lessened blood supply result in the peculiar morbid anatomy of the respective tissues." Endocarditis, arthritis deformans, cementosis and pyorrhea alveolaris are all examples.

Rosenow says: ‡"The abscesses or bony changes found about the roots of teeth in various systemic diseases, especially in cases of chronic arthritis, may or may not be primary, but, if found, the condition should be corrected, because vaccine or other treatment largely fails as long as there exists an active focus of infection, as shown particularly by Billings.

My study on the effects of varying degrees of oxygen tension on the members of the *streptococcus* group, together with other facts, makes it likely that it is in the focus of infection that changes in virulence occur, and the different affinities for various structures are acquired. In other words, the focus of infection is to be looked for—not only at the place of entrance of the bacteria—but also the place where the organisms acquire the peculiar property necessary to infect.

In the light of our present knowledge, the argument that infections in the mouth are so common in individuals in apparent health

*See (8) Bibliography.

†See (9) Bibliography.

‡See (10) Bibliography.

does not minimize their importance. These, or other foci, are so common in patients suffering from arthritis, appendicitis, ulcer of the stomach, and cholecystitis, goitre, etc., and so rare in individuals who have had superb health for years, that their direct etiologic role can scarcely be questioned."

All devitalized teeth that have not been properly treated by the extirpation of the pulp, sterilization of the dentinal tubuli, and their contents, and hermetical sealing of the canal and apical foramen *are septic*.

This statement needs no verification, for it should be patent upon its face to every one. When a root-canal has been treated aseptically, and sealed as just indicated, it is as nearly safe and innocuous as it is possible for present human skill to make it. And yet it is not entirely secure against inflammatory processes by reason of its lowered vital resistance, nor against the dangers from hematogenous bacterial emboli, and consequent lessened blood-supply, to its pericementum.

The establishment of a diagnosis should in all cases be made through consultation with a competent dental or oral specialist. The diagnosis of sepsis having been definitely established, one or the other of two operations should be immediately performed, namely: the securing of *complete and perfect surgical drainage*; or the *extraction of the offending tooth*. It is worse than folly to attempt drainage through the root-canal, as is often done by the dental surgeon. You might as well try to drain a lake through an inch pipe as to drain a dento-alveolar abscess through so small an opening as the apical foramen of a tooth.

Perfect and complete surgical drainage cannot be secured except at the most dependent portion of the abscess, and through an opening large enough to immediately evacuate its contents and prevent clogging. Pus will no more flow up-hill than will water, and yet, many dentists expect it to accomplish this impossible feat, as is evidenced many times by their methods of operating.

A dento-alveolar abscess cannot be properly drained except by puncturing the external alveolar plate, and this is what Nature does when she forms a fistula. The proper place to puncture the alveolar plate is immediately opposite the apex of the root that is involved. This may be done in a moment with a spear-pointed drill, under local anesthesia. Such drainage is efficient and gives immediate relief.

Extraction of these septic teeth should be the last resort, for the teeth are valuable organs and should not be ruthlessly sacrificed; yet the health and life of the individual are worth more than *many* teeth. When the value of a tooth is weighed against the health of the individual, there is no question about which shall be sacrificed. We know of no circumstances under which the exercise of good judgment and a wise conservatism are of greater value to the patient than in cases of this character.

Unless drainage is complete, and can be so maintained, it is better to remove the tooth and curette the abscess cavity, removing all diseased and infected tissue.

With the foci of infection removed—and there is often more than one, as the roentgenogram will show, the case will immediately, in most instances, make a rapid recovery.

Physicians are sometimes, however, greatly disappointed in some of their cases, especially in rheumatic arthritis, arthritis deformans, and endocarditis, because after every discernible focus of infection has been removed, these cases show little or no improvement. This is due, in all probability, to the fact that the foci of infection were not removed until after the *damage to the tissues had been done* by the hematogenous emboli, and the lessened circulation and nutrition of the parts.

Billings says: **“Partial or complete eschemia of the tissues due to embolism is an important factor in the production of morbid anatomical changes.”*

Tissues so changed rarely, if ever, resume their original normal condition. Early recognition, therefore, of focal infections associated with septic teeth, would often prevent the establishment of many serious local and general disorders.

It is evident also, in view of the foregoing facts, that a closer general relationship and co-operation should exist among the general practitioners of medicine and surgery, the dentist, and other specialists, as this would redound to the lasting benefit of the patient suffering from diseases due to septic foci in various parts of the body.

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Periodontia.

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TWENTY years ago, dentistry was held in low esteem as a vocation. Developed as a separate and independent science, by men equipped with meagre preparation in the fundamentals of surgery and pathology, it was considered too cramped and narrow a field for the ambitious student with broad scientific tastes. To-day, as a profession it is broad enough to satisfy students with the highest ambitions for scientific research or professional attainment.

ROOT-CANAL FILLING ONCE AND NOW.

During the period when dental service was largely confined to metallurgy, mechanics, the extraction of decayed teeth and the substitution for them of artificial plates, when the treatment of root-canals was a procedure fraught with doubtful prognosis, and prophylaxis of the mouth held as an operation beneath the dignity of the profession, dentistry was well within the range of its educational capabilities. But with the introduction of gold bridge work came the necessity of "saving" certain teeth that they might act as abutments, and the temptation to retain in the mouth teeth with gangrenous pulp contents, teeth having pathological periodontic lesions, or those with formerly vital pulps which were necessarily destroyed to permit the employment of a dowel or shell crown in bridge construction, created a problem requiring a degree of knowledge with which the average dentist was not equipped. Thus, ever since the advent of the bridge, root-canals containing necrotic pulp remnants may be found under a large percentage of crown abutments. One investigator reports a failure of 83 per cent. of all root-canal operations, as revealed by radiography, in many hundreds of cases examined; another authority states that not 2 per cent. of all root-canal operations are free from apical infection.

In those times the poor peasant and the backwoodsman, having neither the means to secure nor access to the service of the dentist, and therefore allowing their teeth to crumble with decay and break off, were spared the physical disasters following the filling and crown-

ing operations performed upon those who enjoyed greater opportunities. Instinctively, they knew that when drainage of the necrotic pulp was maintained, pain from infections in the periapical region was inhibited, as the profession knows that the hermetical sealing of a pathologic pulp with a filling or crown is followed by a loss of drainage and an alveolar abscess.

Most of us are Doctors of Dental Surgery, and it is assumed that all surgical procedures have the same fundamental principles and precepts; but where, in the annals of surgical history, may be found precedent for sealing within the human body septic and necrotic tissue? Yet this is exactly the kind of surgery that the vast majority of our patients have received at our hands. It is difficult to conceive of a more pernicious or unscientific procedure. It is the tragedy of dentistry; it is a surgical crime committed by the vast majority of us upon our own patients; it is an attack upon the physical welfare of society, and the distant rumblings of the approaching storm of indignation and protest may be distinctly heard. Root-filling requires the cleaning-out of the whole pulp contents under the same aseptic conditions that apply in other surgical procedures. It may not be assuredly accomplished without the aid of the X-ray. The roots are to be filled to and through the apical foramen. Credit for the reformation in teaching may be ungrudgingly given to a few enlightened men who understood the pathological principles, and fearlessly compelled our attention to the havoc resulting from septic root-work. So long as dentistry lives, the names of Callahan, Rhein, Ottolengui, Best, Grieves, and a few others will also live in this connection.

Like medicine, dentistry has made some very serious mistakes that are now covered by six feet of earth and a marble slab.

SYSTEMIC DISEASES OF DENTAL ORIGIN.

Many of the constitutional diseases of obscure or unknown origin that physicians and surgeons have been called upon to treat in the past are now traced to a dental source. It was at first recognized that the infected tonsil and rheumatic disorders had significant connection; later the researcher found that the uric acid diathesis theory had slight scientific basis in fact. Recent work has identified the intimate connection between periodontic infection and such diseases of formerly obscure etiology as rheumatism, myocarditis, arthritis deformans, gastro-intestinal toxemia, certain neuralgias, and many other lesions. Gingival and alveolar infections of numerous forms which have carelessly fallen under the generally accepted term of pyorrhea, and periapical infections, are the two great sources of oral sepsis. The latter, probably, are the most insidious of all oral foci, because the presence of the lesion can only be revealed by the use of the X-ray. Radiographs of these suspected teeth that have given no pain, that are not sore, that have no sinus discharging into the mouth,

will reveal infective processes at the root-end, small cavities where the bone structure has been lost, showing a rarefied spot upon the film. These inter-alveolar cavities usually reveal streptococcus viridans in almost pure culture, exactly as has been found on the cardiac tissue and the synovial membrane. It has also been shown that streptococcus has been found in gastric and duodenal ulcers. That there is a connection in the coincidences has been confirmed by many research workers. We, as dental surgeons, must recognize and assume our share of the responsibility and labor; the physician or general surgeon has neither the training nor the equipment to give relief.

PERIODONTIA DEFINED.

This is the day of the specialist, and while we look almost with awe at the wonderful results achieved by men who have given big brains and great energies to the pursuance of some single branch of a science, we must not lose sight of the interdependence of these branches. Periodontia, perhaps the latest arrival among dental specialists, comprises all prophylactic dental procedures, together with the more special surgery of all lesions of periodontic tissues. The field includes the prevention and treatment of pyorrhea and its allied gingival infections, as well as much that is included in minor oral surgery proper, excepting, of course, exodontia and the marked lesions of the osseous structures which require regular hospital facilities with a general anesthetic. The treatment of root-canals for the relief of infections of the apical area, apicoectomy, and all minor oral surgery, reasonably falls under this heading, as does applied dental radiography—or, as Raper calls it, radiodontia.

It is not my purpose to assist in the erroneous movement divorcing periodontia from general dentistry, for I believe that periodontology is the keystone of the arch of all other dental branches; neither do I wish to include it in the broader field of the healing art of medicine, and thus to hope for any other relation to medicine than that in which it now stands. The foundations of our structure are laid deeply in the necessities of suffering humanity, but the prevention and eradication of disease should, after all, have priority of place in all dental procedure.

THE NEED OF PROPHYLAXIS.

In these more scientific days, our sister profession of medicine is continually asking the co-operation of dentistry in the work of eliminating disease; first, by discarding such methods of our procedure as are known to be the cause of systemic infection, and second, by incorporating in our work such measures as will prevent the development or spread of disease. That disease does arise from within the mouth is no longer a disputable assertion; that dentistry of a certain type has been the direct cause of systemic disease is also true. Aside from these *general* infections that demand hygiene within the oral cavity, there is a considerable number of diseases which come more

particularly within the professional scope of dentistry than of medicine, and the opportunity for work in this field is under the hand of every dentist. While it is true that 75 per cent. of the cases which come to those of us who are making periodontic work our special field of labor are or may be classed as pyorrhea, it is also true that the immense amount of work in the way of preventing *all* the diseases to which the peridental membrane and its allied structures are susceptible must inevitably fall under the scope of the general practitioner. In other words, it is the plain, garden variety of dentist—the all-around thorough practitioner, and not the specialist—who must undertake the work of prevention of disease if any great impression is to be made upon the vast problem of oral prophylaxis that awaits practical solution.

If each patient desiring dental service, whether for the relief of immediate pain or the restoration of some tissue that has been lost through disease, should receive at the hands of his dentist proper prophylactic treatment, who can compute the resultant alleviation of suffering to mankind? The initial gingival infection is the forerunner of most of the destructive processes that result in the final exfoliation of the teeth.

The whole alimentary tract, including the human mouth, is a veritable incubator for the propagation of germ life. Debris, lying in contiguous relation to tooth and gum, finds in the gingival trough a place of lodgment. The infection of this debris soon destroys the epithelial layer of the mucosa lying next to the tooth, opening a way for the passage of bacteria into the vessels, and thence into the blood stream. It is here that we may observe a focus of infection.

VITAL RESISTANCE.

The human body is almost impregnable to invasion of its vascular structures just so long as its integument is intact and it has a normal power of resistance. It is, under certain conditions, so greatly lowered in its powers of resistance as to succumb to a violent attack. The epithelium lying against the tooth-root on the inverted gingival border has cells of smaller size and of lower life potentiality than does the outer layer toward the lips and cheek. Every epithelial cell possesses a high capacity for regenerative construction, but when we remember that the nutrition to this part is supplied by vessels of extreme diminution—or, as Talbot characterizes them, end organs; that their flow is always interrupted by embolic masses whenever they are invaded by bacteria, thus shutting off the nutritive element, and that the tissue is undergoing desquamation due to the presence of infective debris, we realize that its tendency to rebuild seldom can overpower the retrograde processes of attack unaided by intelligent conservative prophylactic interference on the part of the dentist.

It is an accepted theory of pathology that the mucous membrane is a natural protection against infection, that the mucous secretion it-

self has an inhibitory influence on bacteria, and that, where the conditions are normal and the resistance high, the chances of infection are not great, but with the lowering of vitality—that element in combative defence whose function is yet to be fully understood—we observe a concomitant withdrawal of the element opposed to invasion. We observe this in case of exposure, followed by a general pneumococcus infection, as we also do in grippe, colds, and many other conditions which have their foci in the nose or mouth.

ACUTE ULCEROUS GINGIVITIS SUPERINDUCED BY EXPOSURE AND HUNGER.

I have recently observed an interesting case, from the internist's point of view—an acute ulcerous gingivitis, superinduced by exposure and hunger. A young man in very robust health, a curb broker by occupation, whose personal habits in oral hygiene are the highest, went on a duck-shooting trip in one of the southern states. The occlusion of his teeth was normal, and his gums, until this attack, had always been hard and healthy. Subjecting himself to severe exposure on a cold, rainy day, his midday ration being lost through an accident, he returned to camp at dusk cold, chilled through, and with no appetite for food. Concluding that he was too tired to eat, he went to bed hungry. The following morning found him with gums much swollen, bleeding, and extremely sensitive. To alleviate this he used the only remedy at hand, a solution of salt and vinegar, as a wash. He finally decided to return to New York, after four days of suffering, and came to me for relief. The case presented a typical acute ulcerous gingivitis, with the usual fetid breath and sloughing gingival border. It cleared up under treatment, leaving five of the interproximal septal papillæ entirely destroyed, as well as some of the alveolar border.

This disease is one which is very active in its destructive elements, and unless its progress is speedily checked, it inflicts great damage upon the periodontal structures. I was perplexed, in reviewing this case, to observe a mouth which I had recently seen in such an ideal state of sanitation, so normal in every way, becoming so devastated. My preconceived opinion in these cases was that such a mouth was immune; that if a mouth was kept healthy through frequent prophylactic treatments, it was to be considered as safe against such an attack. Black, in "Special Pathology of the Peridental Membrane," does not enter into the etiology of this disease, nor could I find in other dental literature any reference to this subject.

THE PERMEABILITY OF NORMAL MUCOUS MEMBRANE BY BACTERIA.

The reports of Hilgermann's (1) and Flicker's (2) experiments on animals regarding the permeability of bacteria into the normal mucous membrane seem to throw some light upon the subject.

Hilgermann found that when young rabbits and guinea-pigs were fed with tubercle bacilli, these organisms did pass through all portions of the digestive tract epithelium, but more especially the upper part. This passage was not due to lesions of the integument, nor was there evidence of penetration in consequence of an irritation produced by colonies acting locally. The contrary was observed in the normal adult animal except when the vitality was lowered by extreme hunger and fatigue. He concluded that the mucous membrane, under certain conditions, was lacking in the natural protective element which normally inhibits penetration. Flicker's experiments show that these conditions lend susceptibility to penetration, and that the best nourished and strongest organisms are highly sensitive to infection when subjected to these conditions. He induced hunger and, by the use of a treadmill, fatigue in dogs, and observed that its effects facilitated infection. He thought it probable that in the time of greatly increased muscular exercise, the body cells generally suffer a temporary check in their metabolism and in their ability to liberate energy. This infirmity in some way influences the epithelium so as to favor the passage of bacteria. I am satisfied that these references partly explain the infection in the case I have described.

BACTERIAL BALANCE.

The alimentary tract from the nasal meatus and the lips to its distant vent has a continuous unbroken lining of mucous membrane, and within its confines it harbors countless millions of micro-organic life. Herter (3) estimates the number of both dead and living organisms in the daily excreta of the average normal healthy human at 126,000,000,000.

Bassler (4) estimates the average dry-stool specimen of the healthy individual to be composed of from one-quarter to one-third in bulk of solid bacteria. It is not possible for us to comprehend the infinity of these bacterial units. These facts are cited in order to emphasize the relationship these figures bear to the bacteriology of this subject. While food and drink, as carriers, doubtless account for part of the bulk, it is certainly true that there are constantly incubating in a pathological mouth organisms which are not benign in their action upon the system. To what extent this oral flora contributes to the whole we are not prepared to say; but it may be safely assumed that a certain proportion has been incubated in the mouth.

The laws which govern bacterial life are almost identical with those which govern biological life, one variety depending upon another for food and subsistence. No one variety is dangerous until it has increased numerically and the bacterial life is thrown out of balance, causing a war within the confines of our body.

THE DENTIST'S DUTIES OF PREVENTION.

When we realize that organisms of low pathogenicity commonly found in the mouth may readily and rapidly develop a high degree of

pathogenic virility through an alteration of environment, we must recognize our responsibility in the matter of oral prophylaxis and the treatment of periodontic disease. Directly in the line of vision of the dental eye appear, first, the indications of disturbances in body metabolism. We observe a reddening of the border of the gums with the always accompanying hypostasis of the vessels; next we note copious deposits of salivary calculus, or the blue spot in the septal tissue denoting deposits of another type; again, a pus sinus for a chronic apical abscess. Pyorrhea we see from its initial attack upon the border of the gum to the deformity of the advanced lesion.

Let no dentist despise the work that lies here at hand, nor underestimate the import of these significant symptoms, for these are indices of incipient disease, and here are spread before our eyes signs which reveal disturbance in the metabolic process, so evident as to be unmistakable, offering premonitory evidence of maladies to follow at a time when symptoms are recognizable nowhere else in the body.

I have tried to show that periodontic tissue presents exceptional opportunity for the point of entrance of these organisms into the blood stream.

THE SURGICAL ASPECT OF PROPHYLAXIS.

The surgical prophylaxis of these initial infections has a simple technique when the proper instruments are used, and it requires such a few extra minutes of our time to properly instruct a patient in the correct manner of making his mouth toilet, that it is inconceivable how any dentist can fail to make this the first among his many duties.

It is a well-known principle in surgery that lesions of infectious origin heal when the infective focus is removed, however remote that focus may be. We all, as surgeons of the teeth, know that general surgery, in the broader sense, no longer uses escharotics to stimulate constructive processes in the tissue; that it is impossible to do more than mask certain symptoms by the use of drugs; that the employment of ipecac will not remove septic or necrotic tissue in the bottom of a pyorrhea pocket nor restore these tissues to health.

How incredibly blind our profession has been toward the acceptance of truth in the matter of surgery as a cure for periodontic disease—lending ear to false prophets, giving credence to every new nostrum, accepting new superstitions because someone has tried them and found evidence that they are beneficial and must hence be exploited as cures!

DRUGGING VS. SURGERY.

The written works of these men who have exploited instead of studying, who have spouted instead of absorbing, have done infinite harm to dental thought, and are a power that is being felt now in the gravest manner. Hitherto the demand for reform in this sort of teaching has not been of great force; on the other hand, there is a large number of men of clinical rather than literary tastes who have de-

voted years to the practice and application of surgical principles in this work, with satisfaction to themselves and their patients, who have found little time in their busy lives to devote to research in pathology or histology, and who *know* their etiology from long clinical experience. It is men of this type who have made cures and confirmed the findings of their colleagues as to the complete obliteration of the pyorrhea pocket and a true reattachment of the periodontic tissue to the tooth-root in a state of health—a result never yet obtained by other means than by true surgical technique. The work and results obtained by these men have been overlooked by our eminent writers in compiling the findings of their studies, which explains their pessimistic conclusions. These findings, as published, are no less valuable on this account, but they are judgments based upon a one-sided hearing of the facts. The result is engraved upon the dental mind, and students, wavering in opinions from many sources and differing widely in conclusions, have packed away their surgical pyorrhea instruments on a high shelf, and have resorted to the medical applicator or the hypodermic syringe. Later in life, one so taught finds his mind registering one-sided ideas and a pessimism toward any except palliative measures. He may take to the journal and the forum and add to the general confusion. He will talk about the beautiful results of the ipecac or mercurial treatment, tell how the pus stopped, and, what is worse, he will be listened to, read, and believed by those men whose information is the same as his own, and who are looking for some method where skill and training in this special work is unnecessary.

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(2) FLICKER. "Ueber den Einfluss des Hungers auf die Bakteriendurchlässigkeit des Intestinaltrakts." *Archiv f. Hyg.*, 1905, p. 354.

(3) HERTER. "Bacterial Infections of the Digestive Tract," 1907, p. 1.

(4) BASSLER. "Diseases of the Stomach." —*Dental Cosmos*.

In Appreciation of the Late Howard James MacLaurin, D.D.S., Winnipeg.

ON that rapidly growing roll of honor containing the names of those Canadians who have given their lives for Empire must now be placed the name of Dr. Howard James MacLaurin, of Winnipeg, who fell bravely leading his men in a charge to regain trenches on June 14, 1916.

Dr. MacLaurin was born in Vankleek Hill, Ont., July 25, 1887, and graduated with honors in 1909 from the Royal College of Dental Surgeons, Toronto. In 1910 he opened a dental office at 4 Osborne-River Block, Fort Rouge, Winnipeg, where during the succeeding five years he built up a large and lucrative practice.

Soon after the outbreak of war, being deeply impressed by the importance of the issues at stake, he offered himself for active service, obtaining a commission as lieutenant in the 43rd Overseas Battalion then being raised by the 79th Cameron Highlanders. With characteristic energy and thoroughness he threw himself into his new duties, and soon passed the examinations for captain's rank. With his battalion he left Winnipeg on May 29, 1915, and after two months' further training in England was sent to France with a draft to reinforce the 16th Battalion, Canadian Scottish. On this occasion he first came under fire, and successfully initiated his men into some of the duties of trench warfare. Returning under orders to England, he was sent soon after to Aldershot for a course in physical training and bayonet fighting, but in about two weeks was recalled to proceed to France to join the 16th Battalion, being thus the first officer of his battalion to see regular service at the front.

During the nine months following Lieutenant MacLaurin was, on five or six occasions, mentioned in reports for daring exploits, chiefly reconnaissance work in "No Man's Land." While visiting a listening-post in March last he received a gunshot wound in the right forearm and was in the Duchess of Westminster's Hospital at Letouquet for two weeks. Just about ten days previous to his death he was again wounded slightly by shrapnel in the back, but did not go off duty as there was a shortage of officers, and he would not leave his men in the lurch.

On June 14 the Canadian Scottish took a prominent part in regaining several trenches lost to the Germans a few days before. In the attack Lieutenant MacLaurin was in command of his company. In passing through a curtain of fire he was struck by shrapnel, and while being carried off the field was struck again with fatal effect.

Many will be interested to learn that Lieut.-Col. Leckie, in a letter of sympathy, states that Lieutenant MacLaurin was twice recommended for the Military Cross.

All who knew the late Dr. MacLaurin testify to his many sterling qualities. He was a man of generous impulses and strict integrity, and the record he leaves as a soldier shows him to have been possessed of great physical bravery and resourcefulness. In his death the dental profession loses an honorable member and Canada a noble son.

MANLY BOWLES.

Winnipeg, August 15, 1916.

The Research Fund of The National Dental Association.

C. N. JOHNSON, M.A., L.D.S., D.D.S.

AS the time approaches for the meeting of the National Dental Association it is well to have particularly in mind the significance of the present status of the Research Fund. During the past year, under the direction of Dr. Weston A. Price, the chairman of the Research Committee, wonderful progress has been made. A building has been dedicated to purposes of research in the city of Cleveland, and substantial additions have been made to the building fund and the research fund.

In a recent letter from Dr. Price he makes the following interesting statement: "There has been provided in pledges or cash \$27,350 of the \$50,000 required, a little over fifty-four per cent., for the building, and the total of all five-year pledges and donations is a little over \$69,000, which would give us an income, if all could be realized without expense for collection, of \$13,800. The further perfection of the organization and the securing of headquarters and an equity in real property has very greatly stimulated the interest and confidence in the work, for there has been about three times as great an increase in the equities of the Research Department in seven months, since purchasing the building, as in the fifteen months preceding that time. Unfortunately, it is costing about ten per cent. to make collections, besides which many men are careless and are very far behind in their payments. It is exceedingly important that our income be more ample and dependable and, if possible, the burden of providing it more equitably distributed. Six states have already voted to adopt the new basis, to increase the dues one dollar for the support of the research work, in addition to the increase for the Journal. We are confident the entire membership of the National will adopt this plan, which will give approximately \$18,000 a year for research work, which is the interest at five per cent. on an endowment of \$360,000. The trustees of the institute are undertaking to raise a million dollar endowment, and they are confident, with the support of the profession, that this will be accomplished."

The chief thing of significance is the spirit which is spreading in the profession, chiefly through the noble self-sacrifice of Dr. Price. This spirit manifests itself in an awakening wherever he goes to the vast possibilities of research work carried on under the initiation and support of the profession. There is developing a pride among the members in the fact that a profession as comparatively young as dentistry and containing so few in numbers can organize and finance research work on the scale that this has already assumed. Then

there is the earnestness and devotion of those who are actively engaged in the research work itself under the direction of Dr. Price, and the results that are being brought about. One of the chief difficulties in this movement is to develop men who are qualified by nature, inclination and opportunity to do real scientific work, and next to Dr. Price himself the greatest credit for the progress already made must go to the men in different parts of the country who are devoting themselves unselfishly to the actual work of investigation.

All this is having a wider effect than the rank and file of the profession suspect. At the beginning of the movement the greatest barrier to success apparent to the profession as a whole was undoubtedly the question of finance. The matter loomed up in the minds of most men as the really significant problem to solve. And at the beginning it was no small item. But as the profession responded so readily to the appeal for funds, and particularly as the spirit previously alluded to began to develop, it opened up new possibilities, and now let it be whispered that the only thing lacking for an adequate fund to come from outside the profession in support of this movement is a sufficiently enthusiastic endorsement, and a demonstration of the fact that the profession is fully prepared to carry on the work in a thoroughly efficient manner.

The eyes of the world are upon dentistry as they never were before. This is manifest in the present war; in the growing significance of general disorders coming from dental origin; in the awakening to the importance of oral hygiene in our public schools and other institutions, and in various ways which will tend to put us upon our mettle, but in no one respect are we to be weighed in the balance more keenly than in our attitude toward the matter of research.

Let us to a man rally around the Research Committee in a way to prove our loyalty to our profession, and our consecration to the best interests of a common humanity. If we do this now we will lay the foundation for a more wonderful advance in dentistry than has ever occurred in the history of the world.—Editorial, *Dental Review*.

Dominion Dental Council Examination Results, 1916.

PASSED IN MEDICINE, SURGERY AND ANÆSTHETICS.

Clark, E. H.
 Eaid, B. E.
 Fraser, W. R.
 Garvin, Fred G.
 Gibson, G. E.
 McLellan, F. F.

Musgrove, R. G. B.
 McLennaghan, N. B.
 Nichols, M. H.
 Robinson, H. J. D.
 Sproule, G. A.
 Steele, A. C.

PASSED IN PHYSICS AND CHEMISTRY.

Adamson, H. J.	McCormack, R. A.
Abell, H. H.	McLennaghan, N. B.
Barber, W. H.	Murray, G. R.
Berry, Kenneth.	Mullett, H. J.
Clark, E. H.	Maranda, Hubert.
Crozier, A. G.	Plunkett, J. A.
Davison, G. R.	Robb, M. G.
Fulford, C. H.	Sproule, G. A.
Gibson, G. L.	Sproule, S. W.
Hart, O.	Stultz, G. N.
Ingram, T.	Thompson, M. A.
Long, J. B. W.	Turner, J. W.
Lebbetter, J. G.	Wood, C.

PASSED IN ETHICS AND JURISPRUDENCE.

Clark, E. H.	McLennaghan, N. B.
Eaid, B. E.	Sproule, G. A.
Fraser, W. R.	Robinson, H. J. D.
Gibson, G. E.	Sleete, A. C.
Musgrove, R. G. B.	Garvin, F. G.

PASSED IN PATHOLOGY AND BACTERIOLOGY.

Clark, E. H.	Gibson, G. L.
Crosby, R. C.	Musgrove, R. G. B.
Ferguson, H. W.	McLennaghan, N. B.

PASSED IN BACTERIOLOGY.

Nichols, M. P.

PASSED IN PHYSIOLOGY AND HISTOLOGY.

Adamson, H. J.	Hart, O.
Clark, E. H.	McCormack, R. A.
Crozier, A. L.	McLennaghan, N. B.
Davison, L. R.	Plunkett, J. A.
Finnigan, L. M.	Robb, M. G.
Gibson, G. L.	Stultz, G. N.
	Turner, J. W.

PASSED IN OPERATIVE DENTISTRY (PRACTICAL).

Arnott, H. C.	Grant, C. L.
Alyoe, R. H.	Hart, T. F.
Conway, H. R.	Musgrove, R. G. B.
Clark, E. H.	McLennaghan, N. B.
Craig, L. J.	McLaurin, L. D.
Eaid, B. E.	Mills, R. H.
Fraser, W. R.	Sproule, G. A.
Godfrey, R. J.	Sleete, A. C.
Garvin, F. G.	Smith, H. L.
Gibson, G. L.	Siegel, D. T.
Goodhand, H. E.	Taylor, W. J.

PASSED IN ORTHODENTIA.

Clark, E. H.	Musgrove, R. G. B.
Eaid, B. E.	McLennaghan, N. B.
Fraser, W. R.	Nichols, M. P.
Garvin, F. G.	Robinson, H. J. D.
Gibson, G. L.	Sproule, G. A.
	Sleete, A. C.

PASSED IN MATERIA MEDICA AND THERAPEUTICS.

Clark, E. H.
Crosby, R. C.
Davison, L. R.
Ferguson, H. V.

Gibson, G. L.
Musgrove, R. G. B.
McLennaghan, N. B.
Nichols, M. P.

Turner, John W.

PASSED IN ANATOMY.

Adamson, H. J.
Abell, H. H.
Barber, W. H.
Berry, K.
Clark, E. H.
Crozier, A. L.
Crosby, R. C.
Finnighan, L. M.
Fulford, C. H.
Gillispie, T. L.
Hart, O.
Ingram, G.
James, C. L.

Long, I. B. W.
McCormack, R. A.
Musgrove, R. G. B.
McLennaghan, N. B.
Murray, G. R.
Mullett, H. J.
Maranda, H.
Robb, M. G.
Sproule, G. A.
Sproule, S. W.
Stultz, G. N.
Thompson, M. A.
Turner, J. W.

Wood, C.

PASSED IN OPERATIVE DENTISTRY (PAPER).

Clark, E. H.
Faid, B. E.
Fraser, W. R.
Garvin, F. G.
Gibson, G. E.

Musgrove, R. G. B.
McLennaghan, N. B.
Robinson, H. J. D.
Sproule, G. A.
Steele, A. C.

PASSED IN PROSTHETIC DENTISTRY AND METTALURGY PAPER.

Clark, E. H.
Eaid, B. E.
Fraser, W. R.
Garvin, F. G.
Gibson, G. E.

Musgrove, R. G. B.
McLennaghan, N. B.
Robinson, H. J. D.
Sproule, G. A.
Steele, A. C.

PASSED IN PROSTHETIC DENTISTRY (PRACTICAL).

Clark, E. H.
Eaid, B. E.
Fraser, W. R.
Garvin, F. G.
Gibson, G. E.
James, H.

Jamieson, E. T.
Musgrove, R. G. B.
McLennaghan, N. B.
Robinson, H. J. D.
Sproule, G. A.
Steele, A. C.

 Personal.

Dr. C. A. Kennedy, of Toronto, has returned to the city, after having completed a course of instruction at the Dewey School of Orthodontia, Kansas City, Mo.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

Honor Roll

MAJOR P. P. BELLACHEY, 58th Batt.
MAJOR C. E. SALE, 18th Batt., 4th Brigade.
LIEUT. H. J. MacLAURIN, 43rd Batt.

CANADIAN ARMY DENTAL CORPS

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†Acting Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—Care Director Dental Services, Canadian Contingents, 23 Earls Ave., Folkestone, England.

of CANADIAN DENTISTS

ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

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Lieut. T. E. E. Robins.	Lieut. B. L. Washburn.	Sgt. T. D. Campbell.
Lieut. J. A. Ross.	Lieut. V. D. Wescott.	Sgt. H. R. Conway.
Lieut. W. J. Rutherford.	Lieut. G. A. Wilcox.	Sgt. H. C. Goodhand.
Lieut. H. A. Simmons.	Lieut. F. M. Williamson.	Sgt. J. C. Livett.
Lieut. H. A. Stewart.	Lieut. E. H. Wilson.	Sgt. G. R. McMillan.
Lieut. J. A. Stewart.	Lieut. J. H. Wiltze.	Sgt. J. H. Reid.
Lieut. W. G. Switzer.	Lieut. C. E. Wright.	Sgt. H. L. Smith.
Lieut. A. J. Thomas.	Lieut. E. R. Zimmerman.	Sgt. W. J. Taylor.
Lieut. E. L. Thompson.		

Divisional Officers

Capt. T. C. Bruce.	Capt. F. P. Shaw.	Capt. W. G. Thompson.
Capt. A. Dubord.	Capt. Geo. K. Thomson.	Capt. F. M. Wells.
Capt. H. T. Minogue.		Capt. J. M. Wilson.

ATTACHED TO CORPS OTHER THAN C.A.D.C.

Overseas

Major G. S. Cameron, 9th C.M.R.	Capt. J. Harper, Royal Navy.
Major F. T. Coghlan, 25th Battery.	Capt. J. L. McLean, 59th Batt.
Major Chas. A. Corrigan, Army Service Corps.	Capt. Walter McNally, 179th Batt.
Capt. K. C. Campbell, 43rd Batt.	Capt. S. J. Redpath, 47th Batt.
Capt. J. R. Duff, 79th Batt.	Lieut. A. R. Leggo, 58th Batt.
	Staff Sgt. J. G. Roberts, C.A.M.C.

Concentration Camps

Lieut. Col. E. F. Armstrong, 159th Batt.	Major Archie L. Johnson, 229th Batt.
Lieut.-Col. Neil Smith, 181st Batt.	Lieut. A. J. Kennedy, 114th Batt.
Major H. A. Croll, 10th C.M.R.	Lieut. C. Nicholson, 129th Batt.
Major N. Schnarr, 94th Batt.	Lieut. T. H. Renton, 146th Batt.

UNDERGRADUATES

Overseas

Lieut. R. M. Barbour, 64th Batt.	J. T. Irwin, 4th U. of T. Co.	E. S. McBride, C.A.D.C.
F. H. Barry, C.A.D.C.	A. W. Jones, C.A.D.C.	R. B. McGuire (British Corps).
A. Chambers, C.A.D.C.	J. V. Lally, C.A.D.C.	T. E. Walker, C.F.A.
E. R. Dixon, 71st Batt.	J. G. Larmour, C.F.A.	A. Walton, C.A.M.C.
E. Garfat, 71st Batt.	H. B. Legate, C.A.D.C.	B. Watson, C.A.M.C.
J. E. Irwin, C.A.D.C.	W. C. Legett, C.A.D.C.	

Concentration Camps

W. G. Alston, 67th Battery.	E. C. McKee, C.A.D.C.
H. R. Anderson, 67th Battery.	J. M. McLeod, Div. Sig. Corps.
H. G. Bean, 198th Batt.	Wm. Mackay, 67th Battery.
R. Bishop, C.A.D.C.	E. C. McKee, C.A.D.C.
R. T. Broadworth, 67th Battery.	C. T. Moyle, 67th Battery.
A. G. Calbeck, 67th Battery.	G. S. Murray, Army Transport.
A. E. Chegwin, 198th Batt.	A. L. Norton, C.A.D.C.
F. Cluff, 161st Batt.	C. T. Parker, C.A.D.C.
O. G. Dalrymple, 67th Battery.	A. R. Poag, C.A.D.C.
E. N. Elliott, C.A.D.C.	W. A. Porter, C.A.M.C.
R. W. Freestone, 67th Battery.	C. C. Ramage, C.A.M.C.
H. Greenwood, 76th Batt.	H. G. Reid, Mechanical Transport.
G. E. Harper, C.F.B.	W. E. Sherridan, 67th Battery.
G. M. Heisz, Div. Sig. Corps.	G. A. Sierr, Army Transport.
A. S. Holmes, Div. Sig. Corps.	G. H. Sloan, 30th Batt.
G. W. Howson, 126th Batt.	W. H. Smith, 160th Batt.
T. H. Hutchinson, C.A.D.C.	W. L. Smith, Div. Sig. Corps.
R. Hyde.	V. D. Spoor, 67th Battery.
J. T. Irwin, 4th U. Co.	C. W. Steele, 67th Battery.
G. G. Jewitt, Field Amb.	F. L. Thompson, C.A.D.C.
A. N. Laidlaw, Mach. Gun.	

Dental Operations.

PERFORMED BY OFFICERS OF THE CANADIAN ARMY DENTAL
CORPS, IN ENGLAND AND OVERSEAS, JULY 15, 1915,
TO JUNE 30TH, 1916.

Headquarters, C.A.D.C., 23 Earls Ave., Folkestone, July 26, 1916.

Month.	Fillings.	Treats.	Dents.	Prophys.	Ext.	Devit.	Total.
Total operations report- ed to March 31, 1916.	86,887	15,304	10,898	10,710	66,079	11,732	201,610
April	12,343	1,737	1,886	1,393	10,841	1,377	29,577
May	14,874	3,270	2,372	1,501	13,618	1,724	37,359
June	14,479	3,160	2,630	1,503	12,205	1,589	35,566
Total	128,583	23,471	17,786	15,107	102,743	16,422	304,112

Note.—Reports from a number of officers overseas have not been received. It is estimated these would increase the total some 20,000 to 25,000 operations.

J. ALEX. ARMSTRONG, Lt.-Col.
Director of Dental Services, Canadian Contingents.

Dental Services in the C.A.D.C.

“BEST OF THE LOT—EXCEPT THE CLERGYMEN.”



THE above photograph was taken at Valcartier Camp during a recent inspection by the Minister of Militia, Brig.-General Sir Sam Hughes.

The third figure in line from the right is Captain Thomson, Divisional Officer in charge of Dental Services, who is seen conversing with the Minister of Militia. The conversation, as reported, was substantially as follows:

MINISTER OF MILITIA—“And I suppose you look after the salvation of these other chaps.”

CAPTAIN THOMSON—"I am in charge of the Dental Services, Sir!"

MINISTER OF MILITIA—"Best of the lot—except the clergymen."

[*Evidently Sir Sam was misled by Captain Thomson's countenance and thought George was the chaplain. We have often noticed the improvement that k̄haki makes, but who would have guessed that George Thomson could have so changed as to be taken for the camp chaplain? However, the incident shows the friendly and appreciative attitude of Sir Sam Hughes toward the C.A.D.C. Too bad the C.A.D.C. has not a few more friends like Sir Sam in the Militia Department at Ottawa. It certainly needs them.*—EDITOR.]

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

FLASKING.—Before pouring the plaster of Paris into the flask to form the mould, thoroughly dust the inside of the flask with French chalk to prevent the plaster sticking to it. The vulcanized case can then be quite easily removed without bruising the flask.—*Claudius Ash, Sons & Co., Ltd. (British Dental Journal).*

REPAIRING HOLE IN GOLD CROWN.—If in the finishing process a hole is made in a gold crown, paint the outside with a thin mixture of whiting, except round the hole. Plug the hole with gold foil, touch it with a drop of borax water, and put a bit of gold solder inside. Fuse with blowpipe, and success will be obtained.

PREVENTING THE CRACKING AND BLEEDING OF CHAPPED LIPS.—When a patient presents with chapped lips, which would crack and bleed if stretched, the lips are coated with resinol ointment. The lips will then be soft and pliable, and will stretch without cracking and bleeding.—*S. M. Myers, Texas Dental Journal.*

A RECENT ISSUE of *Dental Summary* contains an article by Hugh W. MacMillan, D.D.S., Cincinnati, Ohio, advocating the sterilizing of the toothbrush by covering the bristles with salt while in retirement and lightly shaking it off before using. A bath of vinegar would answer the same purpose, and following the teachings of Pickerrill, it would add to its efficiency as a cleansing agent.—*Oral Hygiene.*

ORAL HEALTH

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Vol. VI.

TORONTO, SEPTEMBER, 1916

No. 9

EDITORIAL

The Canadian Dental Association.

CANADA has earned an exalted place among the nations of the world by virtue of the unfaltering courage and heroic sacrifice of thousands of her citizens upon the battlefields of France and Belgium. These are days when every Canadian is expected to put his shoulder to the wheel and do his bit—days of heavy burden but of large vision. We must learn to set aside all that is selfish and work together loyally for the common good, that there may develop a Canadian nation worthy of the many sacrifices that are now being made.

The new Canada can never be the same as the old. Neither can the dentistry of to-morrow be the same as that of to-day. As a profession we must catch the vision of larger and better things, if we are to do our share in bringing about the advances of to-morrow.

The meeting of the Canadian Dental Association in Montreal on the 12th, 13th, 14th and 15th of September will be an inspiration to those who attend. It is expected that all the provinces will be well represented. Every ethical dentist in Canada is invited, and your attendance is urged that the Canadian Dental Convention of 1916 may be an unqualified success. The programme is to include:

"Mouth Infection and Its Influence on Systemic Conditions," by Weston A. Price.

"Infiltration and Conductive Anaesthesia," by Dr. Logan.

"Some Phases of Pyorrhea," by A. J. McDonagh.

"Dentistry in the War Zone," by Dr. d'Argent.

It will be quite worth while travelling to Montreal to hear any one of these men.

The social activities of the convention will be of such a character as to make the trip a great pleasure and enable the members to fraternize and become better acquainted.

One of the reports of particular interest will be that of the Canadian Army Dental Corps Committee. There have been repeated complaints and suggestions regarding the organization and operation of the newly-organized Dental Corps, and the time has come when these matters should be freely discussed by the dentists of Canada, that there may be a clear understanding of the present status of the C.A.D.C. This convention will be a most important gathering. Don't miss it. All aboard for Montreal!

Oral Clinics Badly Needed.

THE following letter appeared in the Baltimore, Md., *American* of July 18, 1916, under the heading, "Oral Clinics Badly Needed":

"To the Editor: I write to thank you for your recent timely editorial upon the deplorable conditions of the mouths of many of the applicants for enlistment. I wish that you had gone further and noted the fact that 95 per cent. of our school children needed the services of the oral specialist. Oral hygiene should be one of the first considerations of our city authorities. It is my opinion that unhygienic mouths are responsible for more cases of backwardness and poor scholastic endeavor, lack of general development, truancy and other absences from school sessions, bad deportment and general lack of interest in school work than all other causes combined.

"At this time, when we face the possibility of a dread disease of childhood, and think of the innumerable ports of entry for the germ of infantile paralysis in the unhygienic mouths of our school children, surely the city should awake to the absolute necessity for affording the poor of Baltimore better opportunities for attaining oral hygiene. Five hundred dollars was appropriated last year for the opening of a clinic under the direction of the Commissioner of Charities, a much-needed appropriation indeed; and we are all truly grateful for this first money to be expended by the city for oral diseases. Will you not help bring to the attention of doctor and layman alike the absolute necessity for the establishment of a number of oral clinics in our

public schools, so that this menace to the health, growth and general development of our children may be reduced to a minimum? This is the greatest of our present civic needs, and anything you may do to advance the good cause will be hailed with delight by a host of men and women for whom I am the unworthy spokesman.

"Very truly yours,

"Baltimore, July 17.

MERRILL HOPKINSON, M.D."

Dean Hoff, of Ann Arbor, Resigns.

AT the regular monthly meeting of the Board of Regents of the University of Michigan, held recently, the resignation of Dr. Neville S. Hoff, since 1911 dean of the dental college of the University, was tendered and accepted. Dr. Hoff has been a member of the faculty of the dental college since 1887. His resignation was occasioned by the continued ill-health of his wife. Dr. Marcus L. Ward, a member of the faculty of the college since 1903, was appointed dean in his place.

Obituary.

THE LATE DR. AUBREY McELHINNEY.

DR. AUBREY McELHINNEY died Sunday, July 16, at his mother's residence, 252 Lisgar Street, Ottawa, Ont., after a long illness. Dr. McElhinney was the second son of the late Captain Mark P. McElhinney, who was nautical adviser to the Canadian Government, and was born at Truro, N.S., in 1872. After coming to Ottawa he attended the Collegiate Institute, and graduated from the Royal College of Dental Surgeons in 1896. Since graduating he had practised in Ottawa very successfully until about three years ago, when failing health made more rest necessary, and he was forced to reduce his hours of practice. Dr. McElhinney was of a retiring disposition, and gave most of his spare time to reading. His knowledge of general literature, philosophy and medicine was comprehensive, which made him an entertaining companion. He loved music also, and spent many hours at his piano. He was a skilled amateur mechanic, and turned out several fine pieces of cabinet work. He was a member of the Ottawa Motor Boat Association, and took a keen and active interest in that sport. He was held in general esteem by his professional confreres, was a member of several dental societies, and attended the meetings as a quiet but observant listener. He leaves a widow, who was Adelaide Ferguson, daughter of Mrs. Ferguson and the late W. H. Ferguson, of 404 Manning Avenue, Toronto, his mother and two brothers, Drs. Mark G. and George M., to mourn his death.

Books

EVEN when we reckon up all the evil that they may have done, it is still true that, in the struggle of the human race up toward better things, books have played a very important part. When men first learned to put their thoughts down in permanent form for other men to read and ponder over, a great step forward in human history was taken. How vast the sum of that great record of men's thoughts and imaginings, and convictions has grown to be in our day ; how splendid in number and quality are the great books of our time. But books are for reading and study, and not merely to be upon shelves. How great would be our neglect and folly if we were to let them lie there, and miss the help, and uplift, and direction that they might bring to us. To get the habit of reading good books is indeed to walk along a way of life that has rest, and refreshment, and inspiration.

— Selected.



MAJOR-GENERAL LOGIE,
G.O.C., M.D. No. 2



MAJOR W. G. THOMPSON,
A.D.D.S., M.D. No. 2

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, OCTOBER, 1916

No. 10

Local Anaesthesia for the General Practitioner.

H. J. MERKELEY, M.D.S., D.D.S., WINNIPEG, MAN.

THE object of this paper is solely to bring the wide application of local anaesthetics to the notice of the practitioner at large, and briefly to give a technique from which a start may be made. It is not a full discussion of the subject, nor is it meant to be. For this purpose we may dispense with the historical, even avoiding the old standard Cocain, and centreing our interest on Novocain (or Anocain).

The chief competitor of Novocain to-day is the general anaesthetic. True, some worry along relying upon their ability as operators, and inflict much pain under inexcusable circumstances, while others still cling to the exploited theory of Analgesia; but if we are to render our best services it behooves us to give attention to the possibilities of all means at our disposal.

It is not necessary to enumerate the advantages of the general anaesthetic. With these we are all familiar. It will suffice to refer only to the local with Novocain, or its substitute, Anocain, as our choice. Our first consideration is the welfare and safety of our patient. Thousands of successful injections guarantee this. Second—time being our chief stock in trade—it is very necessary to conserve it, and this is unquestionably done with the local anaesthetic. Next in order is, simplicity of apparatus, and then ease of administration. Lastly, from the operator's standpoint, the field of operation is in a much better condition for giving successful results, also for shortening the operation and reducing the shock.

Novocain is selective in its action, having a particular affinity for the nerve tissue, thus systemic involvements is not so extensive as with a general anaesthetic, and being broken up by the parenchymatous

cells of the part, it is soon excreted and the system totally rid of it. It is only fair to say that we must use common sense in conjunction with the syringe. We must diagnose the case at least superficially and proceed slowly with care. This is no cure-all and its use is not unlimited, yet its possibilities are wide and will yield gratifying results to any who care to interest themselves and obtain a grasp of the technique.

Any method of lessening the conductivity of a sensory nerve will lessen the pain experienced during irritation of the tissue it supplies. Hence, we may sever the nerve trunk as in resection for a major tic, giving total and permanent anaesthesia, or again we may temporarily disconnect it from its base (the brain or cord) by the application of a numbing solution applied at some convenient point close to its origin. Lastly, we may affect only the finer branches as they ramify in the tissue. In each case the result is the same, conductivity of sensory impulse is inhibited, and we, having not disturbed the vital centres, have not established a loss of consciousness, but merely a cessation of impulses from some local part. In our practice we use the latter two methods.

Now as to solutions. If the solution be the active factor it follows that we must accord it particular attention. We must know its optimum consistence. In the first place we must bear in mind that all foreign bodies and solutions forced into the tissues act as poisons in varying degrees. The tissue cells live by osmosis, so we must be conversant with the laws relating thereto. It will suffice to give an example to illustrate osmotic tendency. "If we partly fill a hollow glass cylinder with distilled water and tie a piece of animal membrane, 'bladder, etc.,' over one open end and then immerse the tube in a larger container of a salt solution until fluid surfaces are on the same plane, we will find that there is a free passage through the membrane of both salt and water, and the salt passing into the small tube and water passing out into the larger vessel, until there is equal salt content in both vessels, salt passes very much slower than water." We can establish a local anaesthesia by the injection of distilled water, by the law of osmosis (this will swell the tissues greatly and is called tumefaction anaesthesia), or we may use an aqueous solution of high salt content, thus shrinking the cells. In either case a certain amount of anaesthesia is established, but the tissues suffer much and tend to necrose. From the above it will be seen that the osmotic tendency of the solution for injection must approximate the fluid in which the cells are bathed naturally or normal serum. It has been found that solutions of equal salt content or osmotic tendency (Isotonic solutions) freeze at the same temperature. Normal serum was analyzed and found to be Isotonic with a 9% NaCl. solution; later it was found that Ca. and K. salts exerted a very beneficial effect upon cell activity, so the normal NaCl. saline was varied to contain some

of each, with the result that we have a tablet containing .5 NaCl. .04 CaCl. .02 KCl. (Ringers tablets), which dissolved in 10 C.C. of distilled water yields a very desirable vehicle for our drug. Anocain tablets contain salts to give an Isotonic solution when 2% solution is used. Anything less than 2% is Hypotonic, so salt should be added. Ringer's solution, as yielded by Ringer's Tablets, tends to dissolve glass, so should be made fresh at least twice a month, otherwise osmotic balance is lost. It is, moreover, a suitable media for the growth of certain bacteria, so should be kept corked. Having thus a logical vehicle, let us look into the drug itself.

Some authorities explain that Novocain is a synthetic preparation, consisting of a fixed radical plus the anaesthephore radical of the cocain group, so it is fairly stable, while the grosser and varying radical of the natural product being eliminated, it is less poisonous. Referring to cell metabolism, it will readily be seen that anaemic tissues can be affected more easily than the hyperaemic, so a complement is added to novocain to physically produce this anaemic condition. Fortunately for us, a very valuable aid has been found, one that while not in any way decreasing the peculiar affinity of Novocain, really enhances its effect in many ways. I refer to suprarenin or adrenalin. For some time this was obtained from freshly slaughtered animals in the natural state, but this proved unsuitable when boiled, so a synthetic was procured, being derived from guaiacol. Even this gets brown with age, or on exposure to light for any length of time. It is not particularly toxic, as I have seen 1 c.c. of a 1-1,000 Parke-Davis Adrenalin solution injected for asthma. It caused a marked paleness, with a trembling of all muscles, which passed off in fifteen minutes. It had been the habit of this particular patient to self-inject 1 c.c. every five hours during bad attacks. The first injection, possibly three years previously, had been of 10 m.

We must now look to our instrumentarium, the chief article in which is the syringe. Each may have his choice, but a few desirable points should be noted. There must be a sufficient weight to assist us to find our way into the tissues. The plunger should be graduated unless a glass barrel is used. The handle should be of a shape to afford a convenient hold. There should be few washers, other than metal, better none. The needles should vary in calibre, and in length from 1 c.m. to $4\frac{1}{2}$ c.m., and should preferably be of noble metal. Many use steel needles with success, but I believe better and safer results are obtainable if the gold or iridio-platinum needles be used. Steel tends to rust, even immersed in alcohol. It cannot be sterilized in the open flame as is often desirable, if broken in the tissue it may rust, and lastly it is more brittle.

The remainder of our equipment for Novocain work consists of a glass graduate marked off in fractions of c.c.s. up to 5, a small porcelain cup to boil our solution in, an alcohol lamp for heating the solu-

tion (the gas flame throws carbon into any dish held over it), and pliers for handling the tablets.

Let us now consider the anatomy of the parts to be operated upon. Here we meet with fairly constant relationships so that definite directions can be given.

In the mandible we find each lateral half supplied by its own nerve, so that if either be injected paralysis of that side ensues. For dental work it is not necessary to inject as high as the foramen ovale. We should be content with reaching the fossae at the entrance to the infer dental canal; and here depositing our solution, local injections may be made into the mucosa and a fair anaesthesia for some purposes established, the outer plate of the process being porous. Or again, if a deeper anaesthesia be required, as for pulp removal, we may perforate the outer plate in a desirable location and deposit a very small amount of our fluid where it will affect the nerve supply of that tooth or teeth.

In the superior Maxilla, unless we reach the foramen rotundum we will need to inject in several regions for each lateral half, as the nerve trunk branches freely soon after passing this foramen, and each branch becomes attainable only at widely separated points.

The molar supply is blocked on the external of the distal wall of the antrum, really back of and up along the tuberosity of the maxilla. Lingually, the post palatine vessels are found gingivally to the second molar and distally a trifle.

The anteriors and the bicuspid are blocked by the infra-orbital and the linguo-gingival injection.

To understand the routine of injection an infra-mandibular will be given, in detail, while mention will be made of many operations in different regions, each with its indicated injection.

Right here it may be well to refer to suspension fluids; that is, fluids used to suspend instruments in, as for instance, in a type of clamp-top jar so often used. We found that the fluid recommended (absolute alcohol 75%, glycerine 25%) attacked bare steel, likely due to the presence of water in the alcohol, so at present we boil the syringe after use, and then pass alcohol through it, heating the barrel a very little over the flame. Then it is laid away, the piston being lightly coated with vaseline, the alcohol drying up any moisture. Before use it is again boiled and alcohol passed through it, possibly gently heated again over a flame and the piston worked rapidly to dry the barrel. Many use lysol as a suspension medium; this is a dangerous procedure. If skeptical, drop a small trace of 1% solution of lysol into a test tube of Novocain or Anocain and note the precipitation. This is due to the extreme sensitiveness shown by both Novocain and Superanin to Alkalies.

Referring again to the infra-manibular injection. The syringe is prepared as above, a 42 M.M. needle attached, the tablets of Novo-

cain preferably E, the porcelain cup, the C.C. graduate, the alcohol lamp and the pliers are all laid ready. Choosing the right side for our operation, we palpate the region distal to the second (or third molar) and the anterior surface of the ascending ramus. It is concave and triangular, the base towards the disto-gingival of the last molar, it is not a large area, being rarely palpable more than 2 c. to a side. The lingual side of the triangle corresponds to the inner edge of the anterior surface of the ascending ramus (internal oblique line), the buccal side is the external oblique line. More lingually we have in this region the anterior pillar of the pharynx, which on no account is to be confounded with the ramus. It should be thoroughly palpated each time, till all the landmarks of this region are well known. Bucco-lingually, the third molar is at least three-quarter of the diameter of its crown lingual to the retro-molar triangle referred to above. The internal surface of the ramus presents mesio-distally a greater angle to the median line than the line of the arch. In fact, a line from the opposite cuspid is about continuous with this surface. Upon the consideration of this point depends much of the success of the injection. The forefinger having located the triangular depression, and in adults, a point 1 c.m. above the line of occlusion being noted, the area is painted with a weak iodine solution, thus marking the spot. $1\frac{1}{2}$ C.C.'s of Ringer's solution is poured into the porcelain cup; one tablet of Novocain added, and then the cup is placed over the flame, boiling slowly until the tablet is dissolved. The hot solution is immediately drawn up into the syringe, the metal sufficiently cooling the fluid for use. Jar the syringe needle up to expel all air, polish the point with a cuttle fish fine disc to sharpen, and it is ready to use after being wiped on sterile gauze. The forefinger is again placed in the previously located area (the nail facing lingually against the internal oblique line), using a pen grasp on the syringe-barrel with the right hand, the opening of the needle facing the bone, we insert the needle in the predetermined spot, the barrel overlying the occlusal of the first bicuspid on the opposite side. Depositing a drop or two of our solution, we slowly advance the needle, keeping in fairly close touch with the bone. $\frac{1}{2}$ c.m. in we encounter the lingual nerve, so inject a few drops here. We may hit the lingulae (the protection mesial to the fossae, which is our goal), if we do we must withdraw slightly and move the piston end of the syringe towards us, till it overlies the centrals, when it will clear the obstruction, then make it once more overlies the cuspid. This will happen often and signifies that we inserted the needle too low. One point I should have mentioned. It is well before insertion to impale a cork on the needle about 2 c.m. from the end; this gives a valuable guide to beginners as to depth.

The normal tissue is about $\frac{1}{4}$ c.m. thick at the point of injection. The lingulae is 1 c.m. from the anterior bony edge, while the fossae is $\frac{3}{4}$ c.m. wide, so we have a definite guide for the depth to pene-

trate. During the injection we should keep our needle slowly advancing or receding and inject slowly. Arteries and veins have quite thick fibrous coats, but it is possible to corner and pierce them. From observation, I believe it is better not to make the injection above the lingulae, as here the needle is in the midst of a bundle of arteries, veins and nerves, and the chances are injury will be done.

Novocain really dissolves the cholesterin of nerve tissue, so if an endoneural injection be made paralysis will ensue, sometimes persisting for six to nine months or longer.

The first indication of anaesthesia is noted usually in the tongue, next at the corner of the mouth, and takes place in from five to ten minutes, sometimes longer.

By this injection the pulps should be anaesthetized totally in all teeth distally as far as the first molar. The molars, I am led to believe, draw some nerve supply from buccal nerves, as these, if vital, must be desensitized (for third molar operations, and for molar jacket crown preparations, etc.) or pain is evidenced. The infra-mandibular injection is indicated for extensive extraction, extensive cavity preparation, extensive pulp removals, third molar operations, and where local inflammation is severe. It is not indicated in simple operations for a cavity preparation or pulp removal. For this, distally, as far as the second molar, an intra-osseous injection is better.

Novocain having, as has been noted, an affinity for nerve tissue, we can act on the peridental membrane and so desensitize a pulp by placing our solution in close proximity to the apex of the roots. To do this, a No. $\frac{1}{2}$ round burr is used to perforate the external alveolar plate and a short, blunt needle inserted, the tissue at site of puncture having received a drop from a sharp needle previously. In detail, our procedure is this: Locate the area, in the lowers one-third way rootwards from the gingival, paint with iodine, inject one drop with a sharp needle, tense the tissues by applying the index finger at right angle to the long axis of the teeth, and so pressing all removable tissue rootwards. (This is important, as on removal of the finger after the injection the hole in the process will not remain in opposition with the hole in the overlying tissue, so infection is prevented.) Next perforate the thin outer plate with a $\frac{1}{2}$ round burr, which will drop into seeming space suddenly, when cancellous bone is reached, the outer plate only being pierced. Insert the short, blunt needle, and very, very, very slowly inject five to ten drops of a $\frac{1}{2}\%$ solution. We are practically injecting into the general circulation, so proceed slowly, using the minimum amount of weak solution. Operate in three to five minutes. Pulps may be removed or cavities prepared, etc. The first molar is best treated where a definite bifurcation exists by injection into the bifurcation. By this injection I have been enabled to perform the pulp removal from two lower bicuspid and seal dressings in both in seven minutes, inclusive of time consumed in

making the injection. We dare not use intra-osseous where there is a great deal of local inflammation, pyorrhea, etc. Fischer rather objects to this injection, claiming damage to process, but investigation has proved repair is very rapid.

Braun tells us that an ethyl chloride spray played on anaesthetized tissue will lengthen the period of anaesthesia wonderfully. This is of value to us in dealing with areas of local inflammation when some operative procedure is necessary. Here we make four insertions of the needle, forming a rectangle about the inflamed area (Shliech), then we use the spray. This method is not often indicated, but is of some assistance for surgical work. Or we may make a 2% solution of Novocain in Ethyl Chloride and use as a spray, thus no injection is required.

If an ordinary infiltration anaesthesia, as for a single extraction, is desired, we should bear in mind the areas of the outer plate that are porous and proceed accordingly. Briefly, in adults, the area overlying the apical third of the roots in all the uppers and the lower anterior is porous, while the lower molars carry porous process, close to the gingival only. In the young porous areas are more extensive, while in the aged less.

In the superior maxilla we, as was noted above, are not so fortunate in being able to have a single deep injection act on a whole side; we must make two main ones, besides accessory injections.

The nerve supply for the second and third and most of the first molars perforates the process above the tuberosity of the maxilla, about 1 to 1½ c.m. above the occlusal of the third molar. To reach this palpate the zygoma, where it joins the maxilla, inserting the 42 M.M. needles buccal to the third molar, the line of insertion being upwards distally and lingually following the bone so that the fluid may be deposited in the proper place. Use about 1 c.c. of a 1½% solution. The palatal tissue must be anaesthetized by affecting the post palatal nerve as it lies in its groove gingivally to the second or third molar. Situated as it is in a depression, care must be taken not to corner it or its accompanying vessels and so risk perforating them. We may avoid danger of this kind by making our injection beneath the periosteum on the gingival slope of process overlying the molars, that is, between the molars and the groove. Another point of importance is the amount of solution used. More than 10 m. will likely infiltrate the throat considerably.

The infra-orbital injection is, I believe, a questionable procedure for any but skilled operators. One of the trunks to be affected lies deep in the floor of the orbit, so that the foramen must be entered for proper effect, giving us an operation fraught with much danger. 1 c.c. of a 1½% solution is used.

Operations on the anterior superiors to and including the bicuspid may be performed ten minutes after this injection, if the area lingual

to the teeth to be operated upon be anaesthetized. Also a mucous injection high on the labial will give us very good anaesthesia, or we may use an intraosseous.

The area of the affected tissue is circular, so that the interproximal intraosseous injection, which should be made high up on the uppers, will affect both teeth, or in trifurcate molars will desensitize thoroughly. Inject closer to the end of the root in the upper than in the lower to allow for gravity.

It has been my experience that for sensitive cavities, pulp removal, or jacket crown preparation, where the number of operations is not large, we can best use intraosseous. I have been able to desensitize anteriorly as far as the centrals, by an injection between the buccal roots of the first molars. The perforation should be made at a point where the root surface will not be damaged, and I wish to reiterate, inject slowly, using five to ten drops of a 5% solution.

We should find out our limitations as well as our capabilities, and while being cautious we should, after a study of the skull, be ready to take the responsibility of deep injections. There is really very little danger attached to an injection if asepsis be maintained.

It may be as well in closing to make a few general remarks:

- (1) All solutions used should be body temperature.
- (1a) Maintain asepsis throughout.
- (2) Always inject slowly.
- (3) Make as few insertions of needle as possible.
- (4) Where possible, massage area injected carefully upon withdrawal of needle.
- (5) See that every needle used is sharp.
- (6) Always expel the air from the syringe before insertion, preferably by tapping when needle is upwards.
- (7) Use only distilled water for solutions. Tap water varies in salt content.
- (8) In an intraosseous injection, inject distal to the tooth to be affected as roots generally have a distal turn at apex.

In the preceding paragraphs we have been interested in the injection of a solution into the tissues. It naturally follows that we should be equally interested in its elimination. As was noted, the parenchymatous cells of the area injected play an important part in the analysis of Novocain. It, however, falls upon the kidneys to eliminate the by-products.

In passing it may be proper to give advice re the use of restoratives in cases where alarming symptoms develop; although these rarely present, some idea should be obtained of their character, etc.

A swift injection may cause a tendency to nausea, a strong adrenalin idiocrasy may give a trembling of the extremities; with a quickened pulse, and paleness, or again hysteria may begin, very rarely a syncope. Each should be noted at their inception and quickly com-

batted. Fischer recommends five to seven drops of Camphorated Validol in a little water, to be given for syncope or trembling. At present the Greely unit, containing 2 grains of camphor in oil, is obtainable, and may be used with success. It is a collapsible tube, with a needle attached, shielded by a glass tube when not in use. Hysteria, ordinarily, is best combatted by firmness of manner. Eight to ten drops of ether in a small glass of water has almost magical effect in case a stimulant is needed. It has been our plan for some time in extensive cases to give a cup of hot, strong coffee (without cream or sugar) immediately before the injection. This is one of our best stimulants, cerebral as well as heart, so the patient feels exhilarated and is much better able to stand the shock of the operation. After the operation the final effect of the coffee comes into play, acting as a diuretic, and thus greatly assisting elimination. We have found this procedure sufficient to combat any untoward symptoms that have arisen.

A word regarding Anocain may not be amiss. I have found in efficiency non-toxicity and in quickness, it is similar to Novocain; but I believe the field is not as free from hemorrhage and NaCl. solution forming the vehicle, we will not get the beneficial effects of the other salts as in Ringer's.

Fischer, Braun and others have been freely consulted for the above.

The C.A.D.C. in Military District No. 2.

WALLACE SECCOMBE, D.D.S., TORONTO.

THE personnel of the Canadian Army Dental Corps in Military District No. 2 is composed of seventy members, distributed approximately as follows:

Convalescent Home for Returned Soldiers at Toronto	3
Niagara Camp	12
Camp Borden	55
Total	70

The records show that, from this district alone, over 10,000 soldiers have been "made fit" by the Dental Corps—men who were either rejected or who would have otherwise been rejected, because of the condition of their teeth. The invaluable service rendered by the Corps in this district is further shown by the record of operations performed. The figures for the months of June, July and August, 1916, are as follows:

Number of patients treated	9,500
Number of dentures inserted	1,500
Total operations performed	53,778



C. A. D. C. Building—Camp Borden

This work was accomplished by twenty-five operators. While there is a total of seventy C.A.D.C. officers and men in the district, only twenty-five are actually engaged at the dental chair, the balance being on duty in the laboratory, mess, etc.

The great bulk of the dental work of the district is accomplished at Camp Borden, where there are over 26,000 men under canvas. The camp is composed of some 28,000 acres of land, and its cement roadways, electric lights, drainage and water supply give it all the appearances of a permanent military camp, though as a matter of fact it has been occupied but a few short months.. The camp quarters of the Dental Corps are admirably located upon a high piece of ground amidst clumps of pine and silver poplar. The building is a plastered structure twenty-five feet by one hundred and fifty-two feet. The floor is of cement, covered with grey enamel, while the walls and ceiling are finished in white. The only exception is the laboratory, where the walls and ceiling are tinted with a soft green shade of stain.

The laboratory occupies one end of the building and contains bench room for sixteen men, who may be seen working like beavers any day from 8 to 12 and from 1.30 to 5 o'clock. A large plaster bench is located in the centre of the room, and the orderliness and cleanliness prevailing is an example to many private dental laboratories. Electric lathes have been installed, and the standard of workmanship is of a high order.

The other end of the building is occupied by the department of stores, presided over by Quartermaster Lieutenant J. D. Webb. Here may be found a complete assortment of all the dental instruments and materials required. These are kept in such perfect order that the average civilian dentist who visits the C.A.D.C. at Camp Borden immediately resolves that his own stock cupboard will henceforth be properly stocked and kept in better order. A number of S.S.W.



Entrance to Major Thompson's Tent—Camp Borden

portable dental chairs are also stocked, that the Corps may be ready to meet any possible emergency.

In the centre of the building is the large operating room with twenty-four operating chairs, a private operating room, office, and patients' reception room. The reception room is built to accommodate about twelve or fifteen patients, but so great is the demand in the camp for dental services that this room is constantly crowded with from forty to fifty men, with an additional score or two usually waiting outside. It is not necessary to urge the soldiers to visit the C.A.D.C. surgery. Upon the other hand, every possible argument and device is used by the men in presenting their claims to be next in line for treatment.

Hot and cold water, large sterilizer, electric dental engines, fountain cuspidors and twenty-four dental chairs tell the story of the main dental surgery. In addition to this equipment, fly screens and awnings upon the windows indicate how the militia authorities regard the work of the Dental Corps. The C.A.D.C. in this district has been accorded every possible courtesy and assistance by Major-General Logie and Col. Mewburn. These officers have realized the value and absolute necessity of dental service in the army, and have always acquiesced in every reasonable request of the Corps, thus enabling the dentists to work under the best possible conditions.

In certain camps the work of the Dental Corps has to be carried on in spite of the red tape that some officers delight to unwind, but in Military District No. 2 it may be said, to the great credit of those in charge, that the Dental Corps has received nothing but help and encouragement in everything it has undertaken.

The tents within the C.A.D.C. lines are, the large tent where the Corps conducts a canteen, two large mess tents, the cook-house and

refrigerator, a group of eighteen tents comprising officers' quarters, and a group of sixteen tents for N.C.O.'s and men.

The impression gathered by a visit to Camp Borden is that the C.A.D.C. is an integral part of the Militia and not a fifth wheel to the cart. The writer was privileged to visit the camp not long since, in company with a party of about twenty dentists, and the first sight to greet us at the station was a motor truck labelled "C.A.D.C." That in itself seemed to suggest that the Dental Corps had been put "on the map," and it was the consensus of opinion that the clean-cut, orderly and precise way in which C.A.D.C. affairs in the camp were conducted accounted, in large measure, for the standing that had been accorded the Corps.

The dental services in this district are a credit to dentistry, and Major Walter Thompson, Officer Commanding, deserves commendation for what is being accomplished, and particularly for the soldierly way in which he has organized and conducted the Corps at Camp Borden. Major Thompson is familiar with military usage, is aggressive and a man of action, and he has made it possible for the C.A.D.C. members to live and work under the most pleasant and comfortable conditions possible. Well done, Major Thompson!

Dominion Dental Council.

MINUTES of the meeting of the Dominion Dental Council, held in Laval University Dental Department, September 11, 1916, at 10 a.m.

Present: Dr. Abbott (in chair), Dr. Bagnall, Dr. Woodbury, Dr. Jas. Magee, Dr. Geo. F. Bush, Dr. Cowan.

All the above presented credentials.

Minutes of special meeting held in Winnipeg read and adopted.

Dr. Bush presented a motion, notice of which he had given, which read as follows: "That the first part of section 0, article 2, of the Code of Ethics be repealed and that the section in future shall read: It is ever to be regarded as unprofessional to warrant work or operations as an inducement to patronage. It is also unprofessional to violate, or to be a party to a violation in letter or in spirit, of the dental law." This being an amendment to the Constitution, a vote was taken by provinces, resulting as follows:

Prince Edward Island—Yes.

Ontario—Yes.

Nova Scotia—Yes.

Manitoba—Yes.

New Brunswick—Yes.

Saskatchewan—Yes.

Alberta—Absent.

The motion was declared carried and the Constitution amended accordingly.

Dr. Cowan presented a motion from Saskatchewan, which read as follows: "That at the next meeting of the Dominion Dental Council I will move to amend the Constitution so as to provide that the initial date for the class C certificate shall be January 1, 1906, instead of, as it is now, January 1, 1905. This notice I give upon the resolution of the Saskatchewan Dental Association." This being a proposal to amend the Constitution, a vote was taken by provinces, and resulted as follows:

Prince Edward Island—Nay.	Ontario—Nay.
Nova Scotia—Nay.	Manitoba—Nay.
New Brunswick—Nay.	Saskatchewan—Nay.
Alberta—Absent.	

The motion was declared lost.

Dr. Woodbury presented a motion from the Dental Association of Nova Scotia, which reads as follows:

1. "That the standard of preliminary education required by the Dominion Dental Council of Canada be made the same as that required by the Faculties in Arts of recognized Canadian chartered Universities of the various provinces."

2. "That the High School Certificate to be recognized must be those issued by the Department of Education of the various provinces and of the grades accepted for Arts Matriculation or endorsed by some recognized University for Matriculation in Arts."

3. "That the subjects and options required for Matriculation be named in the regulation."

4. "That these regulations shall go into effect for candidates taking the Dominion Dental examination in June, 1917."

5. "That these new regulations shall in no wise interfere with the rights of candidates who will have already qualified under the present preliminary regulations."

Moved by Dr. Magee, seconded by Dr. Bagnall, that the above motion be taken up clause by clause, and that we go into Committee of the Whole to consider same. Carried.

Council resolved itself into Committee of the Whole, Dr. Magee in the chair.

Upon rising, Dr. Magee reported that clause 1 be not adopted, that clause 2 be adopted, that clause 3 be adopted, that clause 4 be adopted, that clause 5 be adopted, that a blank form be prepared to carry the above resolution into effect, and that the clauses adopted be incorporated as part of section 18 of the Constitution.

Moved by Dr. Magee, seconded by Dr. Bagnall, that the report of the committee be adopted. Upon this motion the provinces voted as follows:

Prince Edward Island—Yes.	Manitoba—Yes.
Nova Scotia—Yes.	Saskatchewan—Yes.
Alberta—Absent.	

The motion was declared carried and the Constitution amended accordingly.

Moved by Dr. Woodbury, seconded by Dr. Bush, that we do now adjourn to meet again at two o'clock. Carried.

(Sgd.) E. M. DOYLE,

President.

(Sgd.) W. D. COWAN,

Secretary.

Minutes of meeting of the Dominion Dental Council, held in Laval University Dental School, Sept. 11, 1916, at 2 o'clock.

Present: Dr. Doyle, Dr. Bagnall, Dr. Woodbury, Dr. Magee, Dr. Abbott, Dr. Bush, Dr. Cowan, Dr. Doyle, President, in the chair.

Minutes of the morning meeting read and adopted.

Dr. Magee, as chairman of the committee re affiliation with the non-agreeing provinces, reported as follows:

"Your committee re affiliation of British Columbia and Quebec in the Dominion Dental Council, begs to report that correspondence with members of the profession in both provinces failed to elicit any reply, and therefore I cannot report any progress. I, therefore, ask that I be discharged, more particularly as the secretary has to report a most favorable situation as regards British Columbia."

Montreal, Que., Sept. 11, 1916.

JAS. M. MAGEE.

Moved by Dr. Magee, seconded by Dr. Woodbury, that the report be received and the committee discharged, with thanks. Carried.

The Secretary submitted correspondence had with the officials of British Columbia regarding the affiliation of that province with the Dominion Dental Council.

President Doyle reported the result of his visit to that province.

Moved by Dr. Cowan, seconded by Dr. Bagnall, that we have received with pleasure and interest the report as above, but inasmuch as we have no application from that province for affiliation, therefore be it resolved that the correspondence be filed. Carried.

The Secretary submitted the correspondence had with the Board of Governors of Quebec regarding affiliation of that province with the Dominion Dental Council. He also reported the result of his visit to the Dental Association of Quebec to discuss said affiliation.

Moved by Dr. Abbott, seconded by Dr. Bush, that we have received with pleasure and interest the report as above, but inasmuch as we have no application from Quebec for affiliation, therefore be it resolved that the correspondence be filed. Carried.

The Secretary submitted his report.

Moved by Dr. Abbott, seconded by Dr. Bush, that the report be tabled. Carried.

The report reads as follows:

"Three regular and two supplemental examinations have been held since we last met. At the examination in 1914 there were 48 candidates who wrote on 168 papers, seven candidates failing in eight

subjects. At the supplementary two candidates wrote, both passing. In 1915, 47 candidates wrote on 289 subjects and there were 12 failures. In the supplemental of 1915 four candidates wrote on five subjects. One of these did not receive the necessary number to pass, but was entitled to a re-reading in medicine and surgery. This was granted him and a pass given. At the general examination, 1916, 53 candidates wrote, but on only 186 subjects. Fifteen took the practical examination, but did not present themselves for further examination. As these would be final men, it is evident that some unusual reason is the cause of their non-persistence, and I am of the opinion that the Army Dental Corps was the cause. It is to be expected that these men will complete their examinations when they return, in which case the falling off must be regarded as only temporary. In the examination of 1916 four candidates failed in five subjects and ten men have qualified for our certificate. By residence these are distributed, four to Ontario, two to Nova Scotia, two to Manitoba, and one to New Brunswick. While there has been a marked decrease in candidates in the past three examinations, compared with 1913, where 73 candidates wrote on 325 papers, I cannot attribute it to the severity of the examinations, as there has been a comparatively small number plucked and not a single protest received against the papers. There have been no applications for a class D examination. As all men who could qualify under class D can now qualify under class C there is no object in longer burdening our literature with reference to this class.

Four men have applied for a class C certificate. Three of these have been allowed and issued. Here, too, there has been a marked lessening of applications; less than half the usual number. The one application refused came from a man formerly registered in Nova Scotia, but who had recently moved to Saskatchewan. Upon reference to the Nova Scotia Board, it was found that he had not paid his fees there for some 14 years. His application was rejected. His solicitor then advised your Secretary that he would forward the necessary 14 years' fees to Nova Scotia if assurance could be given that that would be satisfactory. As, however, he had been fined for illegal practice in Saskatchewan, he was informed that he must apply to the Saskatchewan Board for examination. This he has not done, and has since been fined several times.

Early last fall I received several letters and wires from the Quebec Board of Governors asking if I would attend a meeting of dentists of Quebec, to be held in Montreal, to explain the Dominion Dental Council. Believing you desired that I should show every courtesy to a sister province not yet a part of our Dental Confederation I accepted the invitation. A very full discussion was had, but the vote was against becoming an agreeing province. As nearly as I could gauge, the sentiment of those present there was a general con-

currence in the work and system of the Dominion Dental Council and a belief in its advisability, but that it would have to be made to apply more specifically to Quebec before it would be entirely acceptable there. As nearly as I could gather, the desire was to have the right to be examined in French established. This, I understand, would mean that the examination papers would have to be set in French as well as English, and valued by valuers who understood French.

A comparison of the past two years with those immediately preceding shows, in class C, a reduction of ten certificates issued. This represents a loss of one thousand dollars in revenue. If this is to continue, then more attention must be paid to the examination to popularize them. Looking forward, however, it is quite probable that a number of those now serving with the C.A.D.C. may take advantage of the Dominion Dental Council in new fields, their practice having been already broken up by absence. I think it well that we should now determine the course to be pursued to returning men. The probabilities are that many privileges will be asked.

At the recent examination one candidate sent me \$40, advising me that he would write in Calgary. I accordingly made all necessary arrangements with Dr. Heacock, our presiding examiner in Alberta. The candidate evidently did not appear, as I have heard nothing of him since. Dr. Heacock would be placed to considerable expense and inconvenience, but we have no authority to pay him for it. I recommend that he be paid ten dollars, and that fifteen dollars be deducted from the fee paid by the candidate to pay the expenses.

I submit herewith the Auditor's report as the Treasurer's report.

"For your information I quote the exact wording of the resolution passed by the Quebec Dental Association, when I had the honor of meeting with them last fall. The resolution reads: 'That the Board of Governors be instructed to affiliate their college to the Dominion Dental Council when it shall have been proven to their satisfaction that French-speaking dentists may get from the affiliated provinces equal treatment to that given English-speaking dentists in this province.'"

Moved by Dr. Abbott, seconded by Dr. Bagnall, that the clause referring to the examination of Dr. Halt and payment of Dr. Heacock for expenses incurred be adopted. Carried.

Moved by Dr. Abbott, seconded by Dr. Bush, that the expenditure by Dr. Cowan as Secretary of ten dollars on his trip to meet the Board at Montreal be authorized, and that he be re-imbursed to the extent of \$20 for his expenses. Carried.

Moved by Dr. Magee, seconded by Dr. Abbott, that the payment for the expenses of the President on his visit to meet the British Columbia Board be authorized. Carried.

Moved by Dr. Woodbury, seconded by Dr. Bagnall, that the account for the expenses of Dr. Doyle for his visit to the British Columbia Association be sent by the Secretary to the Secretary of the British Columbia Association. Carried.

Dr. Woodbury submitted the following resolution and asked that it be inscribed on the minutes. Resolution passed by the Nova Scotia Board: "Whereas we believe it may be of interest to the profession at large in Canada to know the mind of the Nova Scotia Dental Association respecting the value and importance of the Dominion Dental Council to the profession of dentistry in the province.

"It is therefore declared that after having been since its organization one of the agreeing provinces in the Dominion Dental Council, we are convinced that it has been the means of raising the status of the profession.

"That it has brought to the notice of the general practitioners of medicine the standards of education and training of the dental surgeon.

"That it has in every province been the most potent means of preventing Provincial legislation detrimental to the general welfare, and has inspired good laws."

On motion of Dr. Woodbury, seconded by Dr. Cowan, resolution was ordered inscribed on minutes.

The Treasurer submitted the Auditor's report as his report.

Moved by Dr. Woodbury, seconded by Dr. Bush, that the Auditors be authorized to balance all these accounts shown as owing where the books show they have been charged an amount over the full fee of fifty dollars. Carried.

Moved by Dr. Woodbury, seconded by Dr. Bagnall, that the Auditor's report be received and adopted. Carried.

Moved by Dr. Abbott, seconded by Dr. Magee, that the special summer course now being given by the R.C.D.S. for the purpose of allowing the students in that institution to qualify for service in the C.A.D.A. be recognized by the Dominion Dental Council as a regular course for the purposes of the Dominion Dental Council. A vote being taken by the provinces resulted as follows:

Prince Edward Island—Yes.	Ontario—Yes.
Nova Scotia—Yes.	Saskatchewan—Yes.
New Brunswick—Yes.	Alberta—Yes.

Motion carried unanimously.

Moved by Dr. Woodbury, seconded by Dr. Bagnall, that as a special war measure the Secretary be instructed to communicate with the Secretary of the R.C.D.S. and find out how many students wish to take the Dominion Dental Council examination this fall under the last mentioned resolution, and if enough agree to take the examination to pay expenses, he be authorized to hold same.

Vote by provinces:

Prince Edward Island—Yes.

Ontario—Yes.

Nova Scotia—Yes.

Manitoba—Yes.

New Brunswick—Yes.

Saskatchewan—Yes.

Alberta—Yes.

Carried unanimously.

Meeting adjourned.

Meeting of the Dominion Dental Council, held in Laval University Dental School, Sept. 11, 1916, at 8 p.m.

Present: Drs. Doyle, Bagnall, Woodbury, Magee, Abbott, Cowan, Bush. President in chair.

Minutes read and adopted.

Moved by Dr. Woodbury, seconded by Dr. Magee, that when extraordinary expenditure not authorized by the Council is to be made between sessions the vote of all members of the Council shall be taken. Five members voting in the affirmative shall authorize the expenditure, and that this be made a standing order in a book provided for the purpose. Carried.

The election of officers was then called and resulted as follows:

President—Dr. J. S. Bagnall, Charlottetown, P.E.I.

1st Vice-President—Dr. H. R. Abbott, London, Ont.

2nd Vice-President—Dr. Geo. F. Bush, Winnipeg, Man.

Secretary-Treasurer—Dr. W. D. Cowan, Regina, Sask.

Meeting adjourned.

Minutes of meeting of Dominion Dental Council, held in Laval University Dental School, Sept. 13, 1916, at 10 a.m.

Present: Drs. Doyle, Woodbury, Bush, Bagnall, Abbott and Cowan. Dr. Doyle, President, in chair.

Minutes of the previous meeting were read and adopted.

Moved by Dr. Abbott, seconded by Dr. Woodbury, that a vote of thanks be tendered the Laval University for their kindness in giving us the use of their school for meeting purposes. Carried.

Moved by Dr. Abbott, seconded by Dr. Woodbury, that we express our most sincere regret at the loss by death of Dr. J. B. Wilmott, and that the Secretary be instructed to draft a letter expressing our regret and appreciation of the work of Dr. Wilmott to the family. Carried.

Moved by Dr. Woodbury, seconded by Dr. Abbott, that a vote of thanks be tendered to the President and Secretary-Treasurer for the services they have given to the Dominion Dental Council. Carried.

E. M. DOYLE,

President.

W. D. COWAN,

Secretary.

HORTICULTURE AS A HOBBY FOR THE DENTIST

FRED. G. BRETHOUR, D.D.S.
Spadina Ave. and College St., Toronto

ORAL HEALTH WILL BE PLEASED TO HEAR OF HORTICULTURAL
SUCCESSSES OR FAILURES AND OF YOUR GARDEN PLANS FOR THE
FUTURE. SUGGESTIONS OR QUERIES WILL BE GLADLY RECEIVED
FOR DISCUSSION IN SUBSEQUENT ISSUES.

Peonies

PRESUMING that you will have that border trenched as directed in a recent issue (August, ORAL HEALTH), one of the things that should be planted in the fall of the year is the peony, for the reason that the plant should not be moved until the crowns or buds, which produce the stalks and flowers next year, are matured, and that occurs in this district about the end of September. You cannot do without the peony, for it is one of the *true* aristocrats of the garden, rivalling the rose in color and perfume and surpassing it for decorative effect. Nevertheless, when you speak of peony, most people recall the old-fashioned "piney" of our mother's or grandmother's garden—the *Officinalis Rubra*—of brilliant color, fleeting duration, and rotten odor. When I was in the country last June an old schoolmate of my boyhood days took me to her garden to show me her "pineys." She had the *Officinalis Rubra*, *Rosea* and *Alba*, of which she was very fond. I told her I was very fond of the peony, and that I had some fifty varieties. "Fifty varieties! Not all different colors?" When I told her there were at least one thousand varieties in commerce, she was dumbfounded. "Land sakes! there can be no such thing."

To those who haven't seen the newer varieties there is a revelation in store. Enormous blooms of almost every shape and color, some exquisitely perfumed, some tall growers, some dwarf; they are all beautiful. The prices of the choicest run as high as \$25.

Peonies should be planted between the middle of September and the middle of October. This allows them to take growth before the ground freezes up. The ideal soil is a clay loam, not too heavy with clay nor too light with sand. It is well to thoroughly think out where you want them to remain, as once planted they should never be disturbed, as shifting them puts them back at least two years. The roots grow quite deeply, and as they are gross feeders that explains why it is necessary to have your ground trenched and manured from 2½ to 3 feet. When you order your peonies from the grower you

will get a division, or a one-year, two-year, or three-year root. What I mean is that some dealers just dig up a clump and break off a piece, which is called a division, but the best growers divide up their clumps and grow them one, two, or three years before selling. This is much the better way. When you get your root you will see the crowns, which are from one to two inches long and pinkish or whitish. These are what produce next year's bloom; handle them very carefully as they are easily broken off. In planting place the root so that the crown will be $2\frac{1}{2}$ to 3 inches below the level of the ground, and firm the earth thoroughly around the roots. Do not plant any closer than three feet apart. There is nothing more to do excepting, after the first heavy frost, put in place a loose cover of four or five inches of strawy manure. Next year you may get a small bloom, the second year a fair bloom and the third year you get a perfect bloom, and your plant has grown to huge size of perhaps a dozen stalks.

You will ask what subsequent treatment the plant will require. Well, in spring, even before the frost is all out, as the plant makes an early start, remove the cover very carefully with your fingers so as not to break the crowns, which may be peeping through. Then after growth has started, and the shoots are a few inches high, you may dig in (not deeply) a little fertilizer, such as a handful of bone-meal or some well-rotted manure. When growth has progressed so that you can see the buds forming, give them, once a week at least, a good dose of liquid manure. This is made by suspending a peck of fresh manure, placed in a sack, in a barrel of water, and used weak, or about the color of weak tea. Use this preferably after a rain or watering. Keep doing this until the middle of August and you will see the result the next year. Also, especially during July and August, when weather is dry, give a sufficient supply of water and keep ground stirred up well.

The first year your plant won't need staking, but the subsequent years it will, and a good way is to place your stakes (which are about $2\frac{1}{2}$ feet long and painted green) three to a plant and about 10 inches from the stems. Then get some fairly stiff galvanized wire and cut into a suitable length to go around the stakes and fasten with a bit of raffia. This wire can be raised as growth progresses. The third year it may be necessary to put an extra row of stakes, three to four feet long, and some distance out, with another wire to hold up the bloom, which is heavy and falls over.

In the fall of the second and subsequent years fork in carefully a handful or two of bonemeal in the fall and a liberal supply of manure in the spring. It isn't necessary to put on winter protection any more than cut off the stalks and throw them loosely over the plants.

There are several reasons for the popularity of the peony. In the first place, they are easy to grow,—once established they are permanent features. They are perfectly hardy. They are practically



Marguerite Gerard

free from disease or insects. They are very useful for cut flowers, as well as for decorative effect in the garden.

Speaking of their cutting qualities, they should be cut with long stems, with their foliage intact, cut when the outer petals are nicely opened out, placed immediately in water and conveyed to a cool, dark place in the cellar where there is a free current of fresh air. They open out slowly there and you get a larger flower, and all the beauty of color is retained. Bring to the light as you need them, and you can have a continuation of bloom, (there are early, middle and late varieties), extending a month or six weeks.

The great problem is what varieties to buy. Not knowing much about them when I first planted mine, I bought what is usually sold by every Tom, Dick and Harry. I now have those all dug up and thrown out, losing thereby a couple of years. Be sure to plant such varieties as will satisfy, for it *only* takes the same space to grow good ones as poor ones. It is hard to give a list for it depends on how much money you want to spend. However, in nearly every collection there is Festima Maxima (which is a splendid white, and cheap, about 50 cents), and Felix Crousse, which is a beautiful red and about the same price. Other white ones are Duchess de Nemours (cheap), Madame Emily Lemoine (\$1.50), Avalanche (\$1.50).

Mont Blanc (\$5), Solange (\$10), Le Cyngé (\$15), Kelway's Glorious (\$25). In pale pink are Marguerite Gerards (\$1) Madame Emile Galle (\$1), Eugene Verdui (\$2), Milton Hill (\$4), Mathilde de Roseweek (\$1). Pink and yellow—Carnea Elegans, Golden Harvest, Philomele. Pink and white—Get Therese, if possible. It is scarce. Deep pink—Mons Jules Elie, Edulis Superba, Madame Ducel, Modele de Perfection, are good and medium priced.

For those who want some extra choice ones, get Le Cyngé, La France, Milton Hill, Lamartine (Lemoine), Sarah Barnhardt (Lemoine), Mont Blanc, Raoul Dessert, Tourangelle, Therese, Alsace Lorraine, Mons Jules Dessert, Rosa Bonheur, Mad. de Treyeran, Solange, Prinevere, Mignon, Kelway's Glorious.

Some of the preceding varieties are easily got, but others are scarce, and it may be necessary to get them from the producers,—Lemoine or Dessert, France. However, there are two or three growers close to Toronto who are specializing on peonies, and if they haven't got what you want, they will get it for you. There is a wonderful rage for the peony in the United States and it may be possible that some of the varieties will increase in value. In England the Single Peonies find favor. These I haven't mentioned, nor yet the Tree Peonies, which require winter protection, or at least, as they are early bloomers, they require spring protection.

You will no doubt wonder why the new and fine peonies are so high-priced. The reason is that they are only propagated by root division. New varieties are obtained by hybridization and allowing seed to form. These seeds are planted as soon as ripe and they often take six months to germinate. It takes at least six years for the seedling to throw a representative bloom, and out of 100 seedlings if you get two or three which are worth naming you are fortunate. However, this would be interesting, if you have the room, as one good one might be worth a great deal of money. You can see it takes a long time to work up a stock, and often instead of some variety getting cheaper, it is getting dearer; for instance, Le Cyngé, which was listed in the first place by Lemoine for \$2 is now \$10.50 from him, and cannot be bought here for less than \$15. Nearly all of above choice varieties are getting more expensive.

Now, if you are going to grow any of these, you want to get busy as soon as you read this and get them in the ground as quickly as possible. In planting them I think they look better in groups, and what makes a nice effect with a continuation of bloom is to have your bed bordered with iris, with here and there a clump of daffodils, and between the peonies plant clumps of lilies—the auratum, or speciosum rubram and album or tigrinum, or in place of lilies, you could put phlox. The daffodils bloom in late April and early May, the iris in late May and early June, the peonies in late June and early July, the lilies and phlox in August and September.

THE COMPENDIUM

This Department is Edited by
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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

CARE OF THE MOUTH DURING PREGNANCY.

A PLEA is made in *Dental Cosmos* (September) by Dr. M. Evangeline Jordon for more careful consideration of the teeth of pregnant women. Neglect of these cases is explained by Dr. Jordon as being due in part to "two of the bogies that have been slowest to slink away into the shadows: (1) the superstition that dental care of the prospective mother will produce birth marks upon the child, and (2) the superstition that it is natural for a woman during pregnancy to have trouble with her teeth, and that she must expect to lose a tooth for each child."

Dental surgeons ought to be sufficiently well informed of the facts relating to embryological growth to refute such misconceptions. In other words, medical science must be the means of dispelling such superstitions, because they interfere in a large measure with the well being of the patient. We know that "fetal development is too far advanced before the mother is aware of her condition to affect the developing child—cleft palate with hare-lip being due to lack of union of the superior maxillary bones, which occurs in the second month."

To those who object to receiving dental care at this time because of the likelihood of serious danger to the developing embryo, let it be pointed out "that the histories show many major operations successfully performed upon women during pregnancy, each of which was followed by the delivery of a normal child." It would be well, thinks Dr. Jordon, to point out to these women that there is greater possibility of harm being done to the developing fetus through the suffering caused by indigestion, toothache or the absorption of pus. Undoubtedly there is danger attendant upon dental or other operations performed upon pregnant women. It would be pure rashness to ignore this fact. It is possible for the patient to receive dental shock sufficiently severe as to produce abortion or miscarriage. However, "such a danger is so remote that for all practical purposes we can say that it need not exist if the dentist knows of the

woman's condition, for then he will not undertake long or painful operations."

Prophylactic measures are extremely important during the first three months of pregnancy, especially if there is much nausea. "The teeth and the tongue at this time become badly coated, the saliva is acid and ropy, and the teeth decay in direct proportion to this acidity. Cavities begin to form soon; if a visit is not made to a dentist, the pulps of one or more teeth may die, the woman may suffer day and night from abscesses around the teeth. There are cases on record in which the shock from such suffering has brought on premature delivery." Indeed, it is possible, to bring about a condition due to the poison from abscessing teeth entering the circulation, so dangerous as to cause the death of the fetus.

Another ailment to which pregnant women are very susceptible is pyorrhoea. Dentists ought to be keenly alert and on guard to correct or prevent this condition. This may be done by reducing the inflammation about the teeth and advising the patient to use "a coarser and more fibrous diet in order to stimulate the alimentary canal and to take more water between meals."

If the mother suffers constantly from pus around the teeth, then, says Dr. Jordon, the fetus suffers with the mother in toxemia and this may interfere with its growth. Such interference with the healthful development of the fetus may have very serious effects upon the formation of the embryonic teeth. This seems a reasonable inference when we recall that calcification of the temporary teeth begins about the seventeenth week of pregnancy, followed a few weeks later by the first permanent molars.

The especial care of the mouths of pregnant women should begin just as soon as conception is known. "All tartar should be removed and inflamed gums treated. Any cavities should be cleaned and filled; if there are many, it is best to put in something temporary until the period of nausea is passed. If any tooth is too badly diseased to be saved, it should be removed under an anaesthetic. Other diseased pulps should be treated and roots filled. It is not advisable to have gold fillings pounded in, because of the inevitable nervous strain."

Many observations are made by Dr. Jordon which, while not particularly dental in character, hold the interest of the dentist because they suggest new avenues for the introduction of preventive dentistry. Dr. Jordon is opposed to the practice of bottle-feeding rather than breast-feeding for infants. "One of the ambitions of every woman who becomes a mother," says the author, "should be to nurse her child during the first year of its life. She should avoid all excitement and stimulants, which are now known to have a deleterious effect upon the developing child. Plain, wholesome food, with plenty of fresh air and exercise—but not overwork—will greatly aid in the quest of good health. The most eminent physicians tell us that a

baby while nursing is immune to all the childhood diseases which its mother has had. This means that if the mother in her earlier days has suffered from measles, scarlet fever, whooping-cough or diphtheria, or any of the diseases so common to childhood, then the nursing baby will probably escape contagion if unfortunate enough to be exposed to such diseases."

Continuing her arraignment of the bottle-feeding practice, Dr. Jordon says, "more than twice as many bottle-fed babies die during the first year as do nurslings. In using the bottle there is often a period when the baby is ill-nourished because it cannot digest the artificial food. If this period is prolonged and there is great malnutrition, the growth of the teeth in the tiny jaw is interfered with, and the teeth may be badly shaped, with pitted surfaces. If a child is not nursed it is more liable to have adenoids. When nursed, every little cold is noticed and immediate measures are taken to cure it, while with a bottle-fed baby, the cold may escape notice. Colds necessitate mouth-breathing, which soon becomes a habit and pathological adenoid tissue results from such a condition. This causes the upper arch of the mouth to become high and narrowed. When a child constantly sucks away upon the nipple of a bottle or upon a thumb or finger, the tender upper jaw is pushed up, causing the horseshoe containing the teeth to become narrower than the lower jaw on one or both sides. This must be corrected later on in life at great expense to the parent and great discomfort to the child, while in babyhood, it can easily be prevented. If the child must use a bottle, see that the holes are large enough, and that the bottle is removed as soon as empty. It is not necessary for a child to suck something to induce sleep. Undoubtedly these habits produce malformation of the sinuses of the nose and throat, and may be productive of chronic catarrhal conditions. Another objection to bottle-feeding is that many of the foods used are deficient in lime salts, and poor teeth result. If the food is too sweet it causes rapid decay of the first teeth as they begin to erupt. I have found the anterior teeth of many condensed-milk babies badly broken down at eighteen months or before all the molars were in place."

These observations of Dr. Jordon are quoted at length because of their important bearing on the new thought in dentistry, i.e., prevention of loss of the teeth, rather than restoration of lost tooth tissue. We are forced to the conclusion, in view of recent findings of research workers, that dental restorative measures, however elaborate or skillfully performed, fall far short of perfection, and that the best service the dental profession can render the public is to institute measures having for their object the prevention of dental ailments.

EPULIS.

Many dental surgeons, perhaps, have some difficulty in diagnos-

ing growths upon the gum tissue and about the teeth. It is particularly difficult to distinguish epulis, papilloma, carcinoma, inflammatory conditions, etc. With a view to clearing up this difficulty special study has been given this phase of dental surgery by Doctors John W. Means and Jonathan Forman in the Laboratory of Pathology of the Ohio State University. An account of their investigation of epulides is given in June issue of the Dental Summary and ought to be carefully studied by all dentists. Many patients are unduly alarmed by reason of error in diagnosis by dentists who sometimes brand a simple, harmless growth as malignant.

The above named investigators point out that the word "epulis" in its original meaning signifies any growth upon the gums. Commonly, however, the term is applied to those tumors "which are apparently seated upon the gums or the upper edge of the alveolar border and which are of mesothelial origin." Epulides occur more frequently in younger people and perhaps a larger proportion of the cases reported are women. Single epulides occur most commonly at or near the cuspids or first bicuspid.

In appearance they may be hard, small, and arise between the teeth. "This type is a fibroma pure and simple. After loosening the teeth it spreads out over the alveolar border. The mucous membrane covering the tumor may be slightly reddened, but as a rule differs but little from that of the normal gum. It is as a rule slow in growth, changing but little in its size in months or even years." There is another variety—"the soft, or giant celled epulis. This is a reddish irregular tumor located at the gum border, usually inside of the teeth. This type is usually rapid in growth."

The question of the malignancy of these tumors is a much-mooted one. However, it would be good practice to ascertain their rate of growth by histologic study and determine the degree of differentiation to which the cells are attaining. Then the structure of the tumor must be considered. It should be noted whether these cells are arranging themselves in a position normal to connective tissue, or whether they are typical in both form and arrangement. The progress of the growth of epulis is about as follows: First, the beginning stage when the tumor is not visible and the tooth is not loosened on account of its growth. Neuralgic pains are usually experienced at this time. As the growth enlarges the teeth are pushed apart and become loosened."

The epulides are often confused in diagnosis with carcinoma and sarcoma, as they may appear at the same site. "If, however, careful inquiry into the history, and close physical examination of the tumor are made, the differential diagnosis will not be so difficult. The rate and manner of growth of both carcinoma and sarcoma are so distinguishable of those tumors that epulides should not be mistaken for them."

As to their treatment. All authorities seem agreed that the complete removal of epulides will in most cases effect a cure. The methods adopted for removal may be divided into two classes, (1) radical surgery, and (2) conservative surgery. Radical surgery removes the tumor and its point of origin by excision. "Since this point of origin is often found in the tooth socket, a removal of a portion of the alveolar process will suffice. The safest treatment, by far, is the extraction of the teeth on either side and the chiseling away of a small triangular piece of bone or the removal of the alveolar border containing the point of origin. Recurrences, it is true, are not uncommon where the work has not been of sufficient thoroughness." It is easily seen that such methods for removal of epulis may result in loss of much tissue, especially if the growth has been a long-standing one, because its complete removal will necessitate the loss of all the surrounding teeth, together with a portion of the process.

Dr. Oscar Amoedo, Paris, represents the school of "conservative surgery" in his treatment of epulis. His views are published in September issue of *Cosmos*. Tartar about the teeth, he thinks, is almost always the cause of epulis. Hence, he insists upon a thorough cleaning of the teeth and a survey of the cicatrization and the destruction of embryonal tissues with pure chromic acid applied by means of a wooden or platinum spatula, followed immediately by washing with water.

Dr. Amoedo points out that in a great many cases where these tumors have been removed by radical surgical means there are spontaneous recurrences. He recommends that chromic acid be applied every four or five days until a sclerogenous reticular tissue has formed of such closely stratified texture that it can be punctured with a sharp point without causing it to bleed. Once cicatrization has been obtained in this manner, and if the mouth has been kept properly clean, relapse is impossible.

This investigator has found what is, in his opinion, another efficacious and harmless treatment for epulis, of such a nature as to preclude the extraction of teeth and the resection of the alveolar process. The destruction of cutaneous epitheliomas by arsenous oxid has, says Dr. Amoedo, "been long accepted and adopted as a classic treatment." The use of arsenous oxid was suggested by reason of its action on the tissues about a tooth as exhibited when a portion of an arsenic treatment used in devitalizing dental pulps finds its way out of the cavity. When this happens it is found that the tissues about the tooth become very much inflamed and are finally destroyed. Such destruction involves a small portion of the alveolar process. This fact is seized upon and applied in the treatment of epulis. The common object of all treatment for the destruction of these growths is not only to remove the growth itself but also its bony and dental insertion. As the seat of insertion of the tumor is the

alveolar process, obviously this area must receive attention. Arsenous oxid seems to be particularly efficacious for this because it causes necrosis of the alveolar process, the necrosed part falling away after a lapse of a month or two.

The following is Dr. Amoedo's method of treatment: "A small pellet of cotton saturated with a quantity of arsenous oxid sufficient to destroy the pulp of a large molar is placed against the pedicle of the tumor. The cotton must previously be dipped in cocainated phenol; phenol limits the diffusion of arsenous oxid, and cocaine does away with the pain of cauterization. If after two or three days the tumor has not changed color, it is necessary to make another application of arsenous oxid until the aspect becomes pale. If the tumor is large, it would be advisable to apply several dressings of arsenous oxid all around its base. After a few days, the tumor either sloughs off by itself or can easily be removed. The action of the arsenous oxid must then be neutralized by creating an insoluble arsenate. I use a small cotton pellet dipped in dialyzed iron, which I leave between the teeth in order to form an insoluble arsenate of iron."

We have here two methods for the removal of epulides, the latter of which on account of its simplicity and harmlessness seems to be the more suitable one for dentists.

OCULAR DISEASES DUE TO DENTAL INFECTIONS.

That many chronic infected eye conditions are related to the septic foci existing so plentifully about the roots of teeth is the claim advanced by Dr. W. H. Haskin in *Cosmos* (Sept.). This view, the author recognizes, has long been held by certain English writers, but has received slight attention from American investigators. Among many others, Wm. Lang, surgeon of the Royal London Ophthalmic and the Middlesex Hospitals, is quoted as follows: "Out of 215 cases of eritis attributed to sepsis, 139 were traced to pyorrhoea or other dental lesions, while only 3 were traced to the tonsils and 2 to the nose."

After a lengthy review of recent opinions regarding this important subject in which incontrovertible evidence is submitted substantiating the correctness of his views, Dr. Haskin makes an appeal for co-operation between physician and dentist in searching out and eliminating the foci of infection. He says: "The dental profession as a whole has not begun to realize the seriousness of many of the problems that are being presented to it, and does not seem to be able to appreciate that in these cases it is not a question of whether a tooth can be saved, but rather whether there is any possible infection arising from the tooth and its socket that should be eradicated, and that the only way that this can be accomplished in most of the teeth is by removing them, after which the areas quickly become sterile. For the present it is necessary that we study the return of these foci,

and learn to dictate just what we wish to have done for our patients, not allowing anything else. It is a most difficult position for both professions, and closer relations should be sought by having consultations with each other wherever there is any doubt as to the cause and effect. The writer has on many occasions found foci in his patients' mouths and referred them to their own dentist for treatment, only to have them return with the report that there were no lesions requiring treatment, even when festulous tracts were plainly in sight, and the teeth were found to be reeking with infection when extracted, large pus sacs often coming away with the tooth."

Dr. Haskin considers the X-ray of priceless value in locating the areas of infection about suspected teeth, but is of the opinion that it must not be taken as absolute evidence in all cases. He says: "Some of the worst cases of infection that the writer has seen have given very little evidence on the films of the extent of the tissues involved as found after extraction. It is easy for anyone to pick out clean-cut areas of absorption, but there are many thousand in which the granulation tissue extends well into the alveolar tissues, and the film picture is then very indefinite, and has to be studied with a magnifying glass and under lights of varying intensity."

The author whom we have quoted so extensively is a member of the medical profession and consequently does not fail to attack gold crowns and bridgework—the monuments either of usefulness or folly erected by dentists the world over. This is his view: "I have never seen a gold cap or crown, either when single or when used on two or more teeth to serve as anchors for fixed bridges, that was not the cause of sepsis sooner or later, and I feel that they should never be allowed in any mouth. Fixed bridges are all liable to cause trouble and become lodging-places for sepsis very shortly after being placed, as it is impossible to clean all around them."

So much for the indictment. Now for his remedy. Dr. Haskin appreciates the difficulty attendant upon the filling of root-canals and says, "specimens of bones, wet sections, and ground teeth will demonstrate how impossible it is to eradicate such areas of infection through the minute apices of the root-canals. The writer has studied several hundred of extracted teeth, and has proved how impossible it is to hope to have filled the root canals in a large majority of them. Multiple foramine at the apices, angular terminations, excessive curving and double curving, two canals uniting and then terminating in multiple foramine, and other peculiarities that presented mechanical obstructions to root-canal filling, were found in great number. It is a fact that many of these conditions cannot be demonstrated in the teeth when in situ, owing to the shadows of the jaw-bones themselves. It is hard to insist upon the removal of teeth in many cases, and no tooth should be needlessly sacrificed under any circumstances, but one should never be satisfied that the foci have not been the

cause of other diseases until every possible area has been investigated either by extraction of the tooth or by an opening through the alveolar process to expose the apex of any suspected areas."

PARTIAL DENTURES VS. CROWN AND BRIDGE WORK.

With the regularity of the swinging pendulum, sentiment sways back and forward, first in favor of bridge-work and then for artificial dentures as a means of restoring lost dental tissues. It might be fair to say that at the present time advocates of the partial denture form the larger body. The onus of responsibility placed by the medical profession upon dentistry for pathological conditions resulting from insufficient care in root-canal operations, contributes largely to the increase in the number of those who favor partial dentures. Some writers of prominence in dental circles have stated that immediately a crown is placed upon a tooth its death certificate is signed. There may not be much truth in such a statement but it serves to show the attitude of a large number of thoughtful dentists regarding the prevailing methods of bridge-work.

Dr. Justin E. Nyce, of New York City, has had much experience with partial dentures and very generously presents his views regarding same in a contribution to the *Journal of the Allied Dental Societies* June issue.

An innovation suggested by Dr. Nyce is that when examining a patient preparatory to inserting a bridge or denture, first of all to take an impression of both upper and lower jaws, run the models, and set them in proper occlusion for study purposes. The operator can then consider the bite, stress of mastication, etc., with care and cause no discomfort to the patient.

After securing the impression for study purposes, the teeth are cleaned and polished, cavities filled, roots extracted, etc., preparatory to the impression proper.

Dr. Nyce objects to the practice, so common in many cases, of inserting a bridge on one side of the upper or lower jaw and leaving the other side without teeth. This is done frequently because one side of the arch has no posterior abutment. Such a case is not one favorable for bridge-work, but is suitable for a partial denture, which will restore "the proper occlusion and bite at one and the same time."

An examination of a case where a bridge has been inserted on one side of the arch only, leaving the other side with unopposing force, reveals a condition of elongated, loose teeth around which there is a spongy periodental membrane. In course of time these functionless teeth are lost.

Here are a few of the cases cited as being favorable for the use of partial dentures: "In all cases where the teeth have a tendency to pyorrhoea or where you do not have sufficient teeth to act as

abutments; where the teeth are not properly developed; where the strain would be too great for the abutments, with lack of ability to properly cleanse the bridge.

The author considers that "too many bridges are inserted without any consideration of the engineering principles involved or sanitary conditions. In bridge-work we should consider leverage, strain, lateral movements, force of bite and proper preparation of abutment and parallel lines. All teeth to be crowned should be first devitalized and canals properly filled to avoid future trouble."

The careful taking of an impression is of paramount importance. All the hard and soft places on the palate are to be noted so that the completed denture will cause pressure on the soft parts and be relieved over the hard areas. The use of three thicknesses of tin foil (No. 60) is recommended for this purpose. Plaster of paris is the best material for impression-taking because "it does not draw, breaks with a clean fracture and reproduces all fine lines." Quick setting dental impression plaster made from Sebenite is recommended.

Details of the author's technique of impression-taking, muscle-trimming, etc., are given in the original published article, to which those interested are referred.

Dentists in Active Service May Secure Office Assistant.

TO meet the unusual demand for dentists, created by war conditions, the Royal College of Dental Surgeons of Ontario, conducted during the past summer a special session, for the purpose of advancing the college training of the members of the junior and senior classes. Each student made an agreement to place himself at the disposal of the R.C.D.S. until the time that he would have graduated in the regular way. The senior students, comprising 53 men, have thus completed their college course and write upon their examinations about the middle of October. The successful candidates will be immediately available for work in the Canadian Army Dental or other Corps or to carry on the practice of a Canadian dentist on active service.

This special summer course has been conducted at considerable expense and inconvenience to the college authorities and it is to be hoped that these undergraduates will be so placed as to render the greatest possible assistance to the C.A.D.C. and to dentists in the militia who desire assistance in the conduct of their practice. Correspondence upon this subject is invited by the Royal College of Dental Surgeons, Toronto.

Seven Unerupted Teeth in the Superior Maxilla.*

E. P. R. RYAN, D.D.S., NEW YORK.

THAT foci of infection in systemic and general septic conditions are found in the mouth, in abscessed teeth and infected gum tissue, has been widely accepted by the profession. Actual pus-forming conditions of these organs, however, does not exclude them as a cause of systemic disorders. Pressure from teeth, dislodged from their normal tract, and the deposition of supernumerary teeth, are, in many baffling conditions, the unseen causes of chronic neuralgia, rhinitis, neuritis, nasal conditions and hysteria. I do not presume to offer this as a frequent or common cause in these conditions, but only to present it for consideration when other correct diagnosis cannot be reached.

Supernumerary teeth are much more common than we have hitherto believed, because we had no means of knowing their existence without the use of the roentgenograph. The daily use of the Roentgen ray in my practice has proved the truth of this statement by revealing many impacted and unerupted teeth which were direct causes of nerve pressure. We must realize that there are few normal mouths, that is, mouths in which all the teeth have erupted in proper occlusion, and that the tooth germ cells will deposit in any part of the body to which they may become deflected. A striking feature of the cases recorded in which teeth have been found in the nasal cavity is that only one or two teeth have been found, and in several cases the discovery of the tooth has been made when the patient has shown a tuberculous or syphilitic history.

Hopple† has reported a case of atrophic rhinitis in which the patient was treated for certain periods, and eventually a tooth was forced through the floor of the nose. Joachim§ reports a case in which the patient was treated for specific ulceration of the nasal septum, and a tooth was found in the floor of the nose.

The delay in the healing of the fistula leading from these teeth, in specific cases is recorded by Ingersoll.‡ Removal of the cause is not always followed by immediate closing of the sinus.

REPORT OF CASE.

This case, with the operation, is reported because it appears to be at least unique in that several teeth were found and removed:

Mrs. X, aged 34, consulted me concerning a bridge extending from the left lateral incisor tooth supplying the left central to the right

*Journal American Medical Association.

†Hopple, Brooklyn Med. Jour., 1900, xiv., 403.

§Joachim: Orleans Parish Med. Soc., 1895, iii., 52.

‡Ingersoll: Laryngoscope, 1903, xiii., 688.

central. She asked whether the teeth crowned could be in any way associated with the fistula draining into the right nostril. Examination was made of the bridge, and also the fistula observed; the septum was deflected entirely, closing the opening on the right side. A roentgenogram was immediately made through the anterior teeth, which showed an abscess on the left lateral incisor, and also a foreign formation near its apex. A larger film was used and a second exposure made with the tube pointing through and above the nose. In this roentgenogram a large tooth will be seen which, according to the patient's history, was judged to be the unerupted central incisor, which had never appeared.

The following history was secured from the patient: The sore or sinus in the nose had been extremely annoying, breaking and running with bloody fluid, four or five times a day. She could not breathe through either nostril, and had not done so for about eight years. Each time, following the discharge of the fistula, she became very nervous, suffering from intense pain or pressure in the upper portion of her face, until she had become an extremely hysterical patient. This pressure was also noticed in her efforts at placing her tones high in her head while singing, and when forcing tones she imagined something moved in her head, so that she was compelled to give up her vocal efforts. Six years ago, the patient collapsed and remained unconscious for two days. She states that her case was diagnosed as nervous prostration, and that she never fully recovered from this attack. Two years ago, while dancing, she had felt an extreme pressure in the upper part of her face and again collapsed, this time remaining in a comatose condition for six days. She states the diagnosis was a "blood clot on the brain." She has been in a serious nervous condition since with periodic headaches, following a feeling of pressure and the breaking of the fistula in the right nostril.

Dr. W. H. Haskin was consulted, and the diagnosis verified with the opinion that the tooth highest in the nose was deflecting the septum to the side, and causing the points of inflammation in the right nostril.

No tuberculin or Wassermann test was made.

The operation was performed in my office with Dr. W. V. Ryan assisting. Novocain and epinephrin was the anesthetic used, with infra-orbital, tuberosity and palatine injections.

The left lateral root was removed, and the incision over the apex carried to the base of the nose, with removal of bony tissue, by the use of the chisel and proper dental engine drills and burrs, exposing the nest of six supernumerary teeth. Considerable force and care was required in their removal, as they were packed against each other tightly and embedded in the bony tissue.

The patient's breathing was difficult, and after the removal of these teeth, a very pronounced dilatation of the nostril was noticed.

and she exclaimed about "a wonderful breath of air." The only pain experienced during this operation was in her right ear, which was intense when pressure was placed on these teeth. The nervous condition of the patient prevented further operating, and the wound was packed for ten days.

A more profound anesthesia was secured for the next operation, and an injection made into the nasal cavity. With much difficulty and cutting of adhesive and bony tissue, the large unerupted central incisor tooth was exposed and found to be firmly embedded. By the use of the engine drill and chisel, it was cut off at the incisal edge and carefully worked down until it could be turned into the wound, in order to avoid splitting the surrounding bony tissue. The illustration of the tooth, therefore, does not show its full length; but it was a perfectly formed central incisor.

A minimum amount of tissue was destroyed, and after the wound was healed, no depression was apparent from the outside and only a small evidence over the teeth in the mouth.

One month after the operation, the headaches and neuralgia had ceased, the hysterical condition was much improved, and the breathing was normal through the nose. The sinus in the nose, as in some cases quoted, was slow to heal; however, the bleeding appeared only occasionally.

A removable bridge was placed in the mouth to restore the lost central and lateral, and the patient was dismissed.

The pressure of these supernumerary teeth as well as the central incisor, forcing the septum, will be realized when the curve of the larger of the extra teeth is kept in mind. The three small teeth were wrapped around each other.

CONCLUSION.

I believe that this case is an appeal for all who are treating the mouth, nose and surrounding parts to forestall any chance of error by the use of the roentgenograph. The surgeon may relieve many cases of difficult diagnosis, and every dentist who treats the roots of teeth should not work without the daily use of the roentgenograph.

Oral Hygiene Reports.

Brooklyn, N.Y.—In Public School Section, No. 128, Principal Frederick Crooker has established a dental clinic in one of the larger rooms of the school. The Mothers' Club of the school presented the school with a dental chair and equipment.

Plymouth, Mass.—Charles A. Harris, Superintendent of Schools, recently stated that, in his opinion, few things retarded the education of the child more than poor teeth.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

A GOOD STICKY WAX.—R.: Pure white beeswax, 8 oz.; pure white powdered resin, $1\frac{1}{2}$ oz.; powdered gum dammar, $1\frac{1}{2}$ oz.—*R. G. Donnan, Mackay, Q.*

TO RELIEVE PAIN IN SOCKET AFTER EXTRACTION.—Dip a small piece of wool into pure chloroform and oil of clove and place in cavity; relief will be given in a few seconds.

FASTENING STONES TO WORN-OUT MANDRELS.—Worn-out mandrels may be made to hold a stone well by placing a little soft cement on the screw and running to place in the engine.—*Australian Journal of Dentistry.*

TO PREVENT PROFUSE FLOW OF SALIVA.—A dose of sulphate of atropine (1-120 gr.) three-quarters of an hour before operating will secure a very convenient, though not uncomfortable, dryness of the mouth lasting from four to five hours.

HEMORRHAGE AFTER EXTRACTION.—In a case of severe continued bleeding where other remedies failed a plug of cotton wool dipped in adrenalin and then in tannin stopped the bleeding completely in ten minutes. It forms a pasty mass and seems to stick the gum down.

FOR GRINDING TEETH.—A slight stream of water from a syringe over the tooth or stone while grinding a tooth hastens the operation and prevents pain, and is much better than dipping the stone in a glass of water occasionally, as many operators do.—*E. J. Perry (Dental Review).*

LEMON FOR SMOOTHING THE HANDS.—Plaster and soap, owing to their alkalinity, roughen the hands. These can be quickly rendered smooth again by rubbing them with a few drops of lemon juice, which, moreover, has a decidedly bactericidal action.—*La Odontologia Colombiana.*

JUDGING AMALGAM FOR FILLINGS.—If you will take an occasional glance at the cavity or cavities that you are going to fill with amalgam while you are mixing the alloy, you may save time, and in the long run, money, by not mixing twice or three times as much as you want.—*R. J. Cruise (Dental Review).*

IMPACTED THIRD MOLARS.—In the extraction of impacted third molars, or in other difficult extractions, where the patient prefers a general anesthetic, conductive anesthesia may be used with good results as a preliminary measure. A lighter degree of general anesthesia will be necessary and the shock will be lessened.—*A. E. Converse (Dental Review)*.

TO REMOVE SCRATCHES FROM VULCANITE PLATES.—A cork from a ginger-beer bottle is much better than any felt cone for removing the scratches from a vulcanite denture. Fit one to the lathe and trim up to cone shape with a rough file. Once you use a cork you will not bother going back to felt cones. Besides, corks are much cheaper.—*J. Fred Gordon (Commercial Dental Review)*.

THE SALIVA EJECTOR A TIME SAVER.—Times were when the saliva ejector was used only during short stages of our work, and thus the patient was free for conversation, and tactics of delay for a good portion of the sitting. But times have changed. "Talk is cheap" is no more applicable here than when one calls up "long distance," therefore every effort must be made to cut out the conversation line. Talking and the constant rinsing of the mouth by the patient, formerly the greatest of needless time consumers, have for some time been, if not entirely, cut out; at least reduced to a minimum by the constant use of the saliva ejector.—*C. E. Kells (Dental Review)*.

COLOR CONSIDERATIONS IN SELECTING ARTIFICIAL TEETH.—The following factors must be taken into account and guarded against if we would make successful matches of color in selecting artificial teeth. A bright object appears brighter when put alongside of a darker one, and vice versa. And just as an object that is placed alongside of red takes on a greenish tinge, so the human teeth appear greenish when seen surrounded by the healthy tissues of mouth and lips. Thus teeth that in themselves are of a decidedly orange hue will often appear greenish yellow as a result of their being surrounded by very red tissues. In short, the factor of negative after-images and simultaneous and successive contrast tends to make the teeth appear of a different hue and a different brightness when inside and when outside of the mouth.—*F. H. Orton, Journal Allied Dental Societies*.

SECURING THE CERVICAL MARGIN.—When burnishing amalgam, piece by piece, against a matrix band of thin material, the matrix will frequently give, allowing the filling to protrude beyond the cervical margin. I have found that, after applying the ivory matrix and holder, a very useful way of minimizing this danger is to take two thick gutta-percha root-filling points and to insert them, one from the buccal and the other from the outside, of the matrix between this and the next tooth, thus wedging the matrix at the cervical margins; above this wedge the matrix is burnished out to the contact point.

The amalgam may now be thoroughly condensed along the cervical margin; unless the caries has extended very far below the gum the edge of the filling and of the tooth will be kept quite flush.—*F. N. Doubleday, M.R.C.S., L.D.S., England (British Dental Journal).*

BLEACHING OF TEETH.—The author employs a 25 per cent. solution of hydrogen dioxide, supplemented by the application of heat obtained from an instrument of suitable shape, which is applied to the cotton holding the solution, the instrument being previously heated over the flame of an alcohol or Bunsen burner. In those cases in which the line of cement around a porcelain inlay has become discolored, after adapting the rubber dam, a pledget of cotton carrying the solution is placed upon the area to be bleached and thereon a hot instrument is placed upon the cotton, the instrument being so shaped as to prevent as far as it may be possible the escape of the vapor so produced away from the tooth. In the case of a discolored front tooth, after the root-canal has been rendered thoroughly aseptic and the apical foramen has been hermetically sealed, the solution is carried into the crown cavity and the root-canal and the external opening is closed with an instrument of suitable shape sufficiently heated to produce the evaporation of the concentrated hydrogen dioxide solution. The satisfactory results which the author reports are to be attributed almost entirely to the fact that every possible effort is made to confine the vapor of the solution employed within the tooth to be bleached.—*Le Journal Dentaire.*

SILVER-PLATING SOLUTION.—Dissolve silver nitrate crystals, 2 oz. in distilled water 4 pints, and add a 20 per cent. solution of potassium iodide as long as it produces precipitation. Collect the precipitate and wash it until free from nitrates, then dissolve it in hot strong solution of 99 per cent. potassium cyanide. Use only just enough of the cyanide solution to dissolve the precipitate, then dilute the solution to 1 gallon. For use this solution is warmed to about 180° F., and the articles, thoroughly freed from grease, are immersed in it for about two minutes. Another formula consists in dissolving 20 gm. silver nitrate in 60 gm. nitric acid, adding a little water and precipitating with a solution of caustic potash 20 gm. in distilled water 50 gm. The precipitate is collected, washed, and dissolved in a solution of potassium cyanide (99 per cent.), 100 gm. in a very little water, finally diluting to 2 litres. Some of the liquids of this description contain a considerable amount of Paris whiting, which is meant to facilitate contact of the solution with the metal when applied with a cloth pad, and it also has a polishing effect. For this purpose, run into the stock bottle enough of the powder to occupy about a third of the space, fill up with silver-plating solution, and shake well.—*Pharmaceutical Journal and Pharmacist (Dental Record).*

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Vol. VI.

TORONTO, OCTOBER, 1916

No. 10

EDITORIAL

The Dentist and Malpractice Suits.

A DENTAL practitioner who is brought face to face with legal proceedings for alleged malpractice has a feeling of being much alone in the professional world. Ask the unfortunate himself and you will be assured that his statement fully describes the situation.

To urge that some adequate steps be taken to remedy such a situation is the reason for this editorial. The number of malpractice cases, real or fraudulent, whether settled or fought out in the courts, is much greater than is generally supposed. The professional man is not usually anxious to make public such unfortunate occurrences in his practice. Many suits are instituted by mistaken or unscrupulous individuals, knowing very well that most dentists shrink from such occurrences being made public, and will therefore settle rather than go to court.

This serious question arises: Should not the dental profession as a body take definite steps to protect its members and uphold the dignity of the profession in all such cases? If the complainant understood that all such charges against a dental practitioner are investi-

gated and defended by the organized profession, many hastily instituted cases would never materialize.

The dental profession in other countries is moving in this important matter, looking to the better protection of the individual practitioner. It is being urged in the United States that the N. D. A., for an extra fee charged, undertake the protection and defence of its members in all threatened malpractice suits. New Zealand also has taken action in this direction by the organization of a Defence Fund in connection with the New Zealand Dental Association. It would seem that the time is ripe for the Provincial Dental Societies to look more carefully after its members in regard to such matters.

At least one step might be taken without much added expense to the Society. It is a well known fact that many dentists are ill-advised, and many unjust decisions rendered, through the incompetency of counsel employed, or through counsel not having properly prepared their case before appearing in court. Would it not be a wise and proper move for the dental profession to employ a competent member of the legal profession, who would undertake to defend the members of the society in all such ill-advised damage suits? Such counsel need not necessarily be a "high priced man," but one who has, or who would be willing to, make a study of the legal aspect of dentistry, and so bring his special knowledge and experience to bear on the case.

The adoption of such a forward step would, we believe, result in material benefit to both the society and the individual members of the profession. By so providing for its *bona fide* members the services of a specially equipped counsel, whose advice and services would be at their disposal in all such cases, the Society would undoubtedly gain many friends and render important service to the profession. We understand that next year the Ontario Dental Society will celebrate its fiftieth anniversary. Would such an occasion not be a suitable time to take the step advocated here?

Activities of the C.A.D.C. in Canada.

THERE have been at times during the past year, in training and distributed in military camps throughout the Dominion, as many as 132,000 Canadian soldiers preparing for active service overseas. At the present time over 87,000 are under canvas. The dental condition of many of these men, at the time of joining the militia, was of such a character as to require very extensive treatment by a dental surgeon. Militia regulations have been so amended that recruits are now permitted to "sign up" without regard to the condition of their teeth. The men are attested and turned over to the Canadian Army Dental Corps to be made fit. This plan enables the military training

of the recruit to proceed synchronously with necessary dental treatment, and the members of the C.A.D.C. are working to the limit of their resources, that in so far as may be possible, the soldiers' dental needs may be met before going overseas. It is only as we fully appreciate these facts that the great importance of dental work in the Canadian military camps is realized.

Lt.-Col. Clayton is to be congratulated upon the present organization of the dental services in Canada.

In this issue we publish an account of the work accomplished in Military District No. 2. In our next issue we hope to present an outline of the work undertaken in convalescent homes for returned soldiers and also an account of the activities of the C.A.D.C. in the city of Winnipeg and Military District No. 10. We hope to be able, from time to time in subsequent issues, to describe Canadian Army Dental Corps work in the remaining military districts of the Dominion.

Horticulture as a Hobby for the Dentist.

DURING the past few months there has appeared in Oral Health a series of three articles outlining the activities of certain dentists along horticultural lines. These articles were published because of the outstanding advantages of gardening as a health-giving hobby for the busy dental practitioner. Horticulture is sincerely recommended as an antidote to many of the ills to which the close confinement of the office subject the dental operator.

Attention is drawn to an excellent article upon the peony by Dr. Fred. G. Brethour appearing in this issue. The pages of the Journal are thrown open to dentists for discussion of the many phases of the subject and we hope this invitation may be so generally accepted that Oral Health will become a practical clearing-house for ideas upon horticulture, as they may be of benefit or interest to the dentist.

American Institute of Dental Teachers.

THE next annual meeting of the American Institute of Dental Teachers will be held at Hotel Adelphi, Philadelphia, Pennsylvania, January 23, 24, 25, 1917.

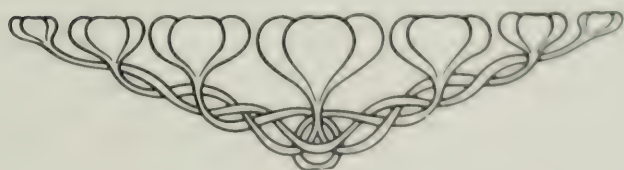
A number of papers, reports and discussions relating especially to dental education will mark this meeting. All dental teachers are cordially invited to be present.

ABRAM HOFFMAN, *Secretary*.

529 Franklin Street, Buffalo, N.Y.

THE RELATIVE DUTIES OF DENTISTS AND PHYSICIANS

“**D**ENTAL surgery is a specialty in medical science. Physicians and dentists should bear this in mind. The dentist is professionally limited to diseases of the dental organs and adjacent parts. With these he should be more familiar than the general practitioner is expected to be: and while he recognizes the broader knowledge of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty.”





CAPTAIN CHARLES E. McLAUGHLIN
C.A.D.C., No. 2 Canadian General Hospital
France.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

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TORONTO, NOVEMBER, 1916

No. 11

Oral Surgery and the War

CAPT. CHAS. E. McLAUGHLIN, C.A.D.C., No. 2 CANADIAN
GENERAL HOSPITAL, FRANCE.

[Captain McLaughlin is to be congratulated upon the excellent work he is doing at the front. In a letter to the Editor, Captain McLaughlin explodes the theory that the members of the C.A.D.C. have no place at the front line in time of war. To quote:—

"We found at the front a base dental laboratory unsatisfactory in procuring dentures for soldiers in the firing line. We procured a one flask vulcanizer, so great was the demand for dentures and repair of dentures. In one month, by working overtime, we turned out 102 new dentures and repaired 30 old ones. This was our biggest month for dentures. Sergt. Mansfield and Orderly, Pte. MacKenzie, have worked faithfully from early morning to late at night. The vulcanizer is indispensable in the treatment of fractures of the jaw."

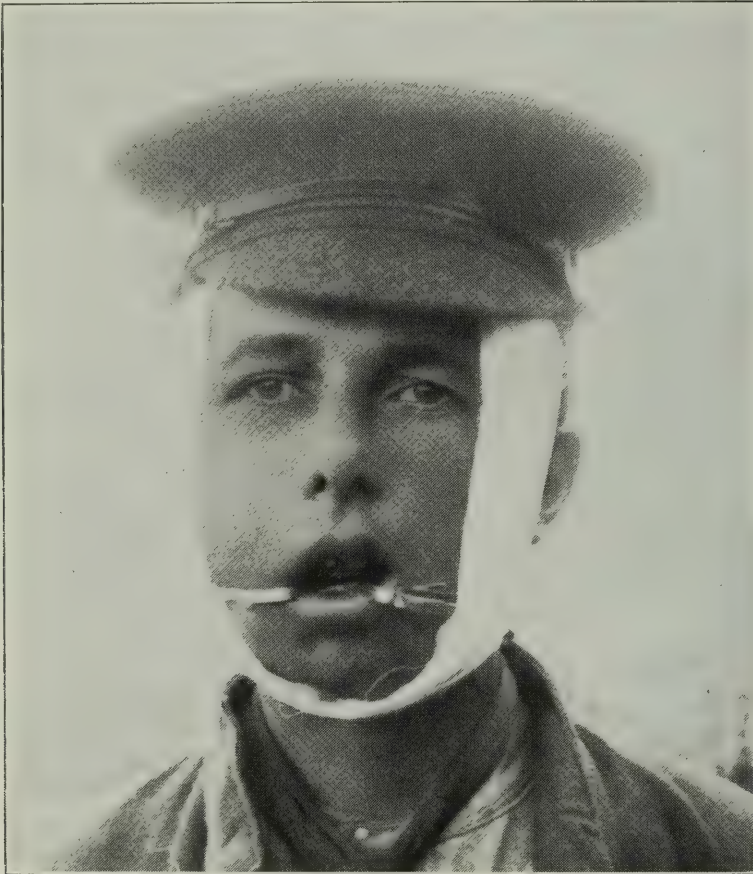
The profession in Canada will be glad to learn that Capt. McLaughlin has been fortunate in having the active co-operation of the members of the Canadian Army Medical Corps. Unfortunately some other members of the C.A.D.C. have not met with a similar reception in other parts of France. The result has been to deprive thousands of soldiers in the trenches of the important services that Capt. McLaughlin has been able to render. It is to be hoped that under the new conditions which now obtain in the C.A.M.C. there will be greater co-operation between this service and the C.A.D.C., these two being among the most important branches of the Militia.—Editor.]

THE war has made the subject of fractures very urgent on its practical side, and it is to this phase of the subject that the present paper is particularly devoted.

The operative details in connection with wounds naturally vary with the site, nature and degree of infection in the wound. Instruments, if possible, should be made of metal throughout, so that they can be sterilized with ease by boiling in a weak solution of carbonate of soda (about one per cent. or one and a half drachms to the pint). Sharp cutting instruments are certain to be blunted by this treatment.

and should be treated with alcoholic solution of carbolic acid (1 in 20) immediately before use, and thoroughly cleaned after each operation with a brush and Lysol. There is no doubt that the fewer the instruments to which a dental surgeon accustoms himself, and the simpler they are, the better. He who is really expert with one instrument has an advantage over him who is indifferently familiar with many.

In the dressing of wounds, it is not so much the antiseptic used as



Pte. Willson, wounded battle of the Somme in July—part of right cheek shot away—wound seven inches long, three and a half inches wide—Ramus partly shot away—jaw broken in three places—lay unconscious twelve hours. Performed plastic operation, drainage tube to ramus—applied interdental splint and elastic band to overcome contraction of the tissue while healing. This picture was taken four weeks after operation. Still some swelling in right cheek. Five weeks removed splint—jaw was satisfactory—excellent circulation—could eat as well as ever.

its intelligent application that counts. There are cases in which the application of one lotion is more suitable than that of another. One should never become an extreme enthusiast in any method of dressing, as one then becomes a danger to one's patients. Freedom of choice is essential. Hydrogen Peroxide cleans a cavity quickly and is a good deodorant. It is a weak antiseptic and one which produces its

total effect at once. Its mechanical effect is practically its only recommendation as a lotion for dressing. Biniodid spirit, glycerine and ichthyol produce free discharge and require frequent changing.

Sterile gauze or double cyanide gauze are both good dressings for visibly clean wounds. When gauze is too adherent its removal may be accomplished by the use of hydrogen peroxide. Iodine induces a serous flow and is very irritating as a dressing. Injections of polyvalent serum do good in many cases when used before an operation on a granulating wound, where bone has to be removed or a plastic operation performed. There is less reaction if a full twenty-four hours is allowed to elapse between injections and operation.

The method of dressing wounds with a firm pack of gauze and sodium chloride tablets has effected a revolutionary change in methods



Before Operation

Willson Case—Plastic Operation

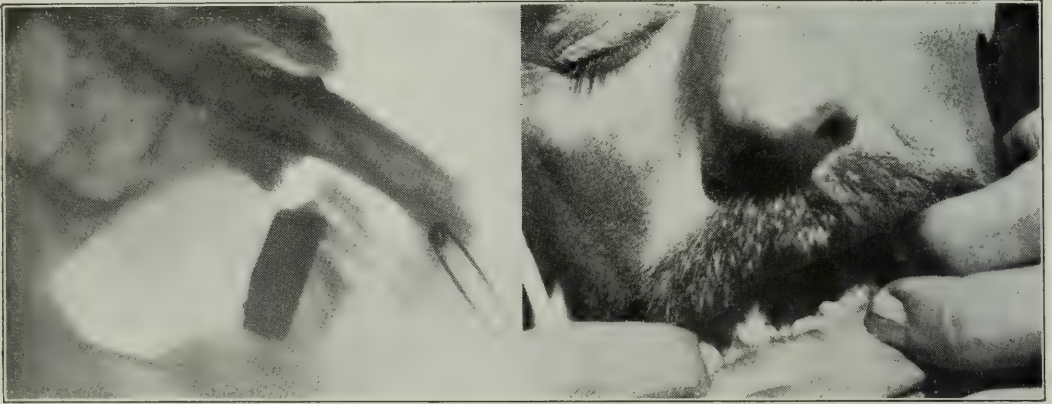
After Operation

of treatment. During the past six months this method has supplemented other methods in many cases.

Intravenous injections of Eusol, to combat blood infections and toxemia in cases of septic infection, is the latest method, as presented by Professor Graham, of Edinburgh. Gas gangrene, following gunshot wounds in this war, is very common. The onset and progress of the gas distension, which precedes the gangrene, is rapid beyond belief, unless seen. The toxemia is so fatal as to be unparalleled when infection becomes general; on auscultation gas may often be heard circulating in the heart, like the sound of a boiling kettle. This gives rise to great distress, and often to a sallow, contorted, almost titantic feces. With this pitiful picture surgeons in France are only too familiar. In the earliest stage freest possible drainage, followed by constant lavage with sodium hypochlorite, and intravenous injection of Eusol will usually succeed. This method of treatment has

opened up a new field of investigation. The solution injected is Eusol, to which common salt has been added in the proportion of 8.5 grams per litre. Prepared by shaking up 25 grams of a mixture of equal parts chloride of lime and boric acid in 1 litre of water and subsequently filtering; the solution of Eusol should be warmed to about the blood temperature. The borate gives the solution a reaction faintly alkaline to litmus. It is preferable to introduce the solution without exposing the vein. A superficial vein in front of the elbow is usually available, as the rate of injection should be slow—usually about 10 c.cm. one minute. The initial dose should be from 50 to 100 c.cm.

Warmed anesthetic vapors have the advantage of increased safety of anesthesia, diminished loss of body heat, induction quicker and more quiet, respirations calmer and a lessened tendency to post-



Pte. J. Elks. Interdental Splint, June 9th, 1916. Comminuted fracture of mandible, one inch to right of median line, slight displacement—large foreign body in centre floor of mouth. X-ray report 2622 and 2622A. Treated him by removing foreign body and a special splint fastened to jaw. In six weeks removed appliance. Jaw O. K.

operative bronchial affections. Ether and chloroform vapors are passed through a thermos bottle containing hot water, with vapor tubes leading to the mask.

Fractures of the maxilla are caused by direct violence. The seat of fracture is determined by the force and direction of the blow and location of the teeth in the jaw, the jaw being weakest where the teeth have been lost. Fractures of the base of the skull through blows on the jaw are more likely to occur if the mouth is open. Fractures of the body of the bone are common; of the condyloid and coronoid process, very uncommon. From bullets, shrapnel and high explosive shells there is no choice of locality. The results are horrible wounds and complicated fractures. The treatment taxes the oral surgeon's ingenuity to the fullest capacity: in many cases the greater part of the mandible is shot away.

Symptoms of fracture are pain, crepitation and abnormal mobility,

swelling, teeth contiguous to the fracture either displaced or loosened. Displacement detected by noticing the difference in level. The submaxillary and adjoining cervical lymphatic glands become enlarged. Salivary secretions increase in quantity—dribble out of the mouth. Suppurations often appear with offensive penetrating odor. Cervical abscesses, difficult to manage, often appear; necrosis associated by a brawny infiltration in the submaxillary and upper carotid triangles.

The primary object of treatment is the preservation of normal articu-



Pte. Leslie Keans, wounded battle of the Somme. Fracture of mandible one inch to right of symphysis and superior maxilla from right central to 1st bicuspid tooth. Caused by being thrown from motor cycle.

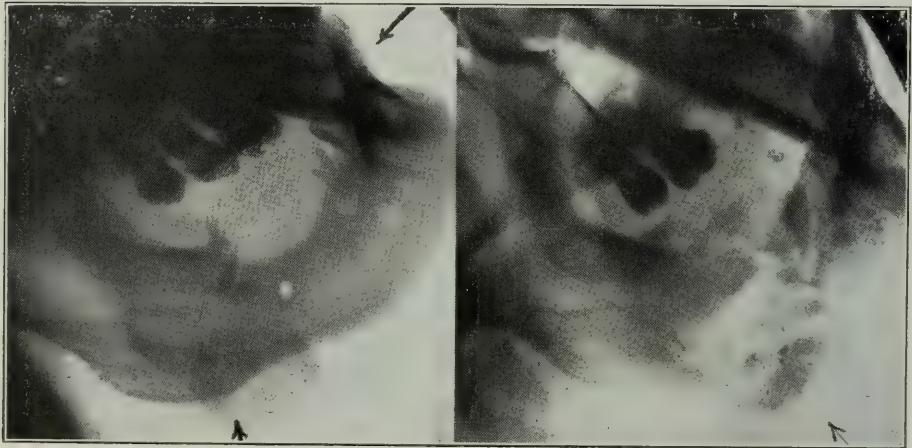
lation of the teeth. This object is attained by a complete reduction of the fragments of the fractured bone. Displacement can be corrected by digital pressure upon fragments. Having reduced the fracture, it is most important to hold the fragments in proper position.

There are several methods. Wiring together corresponding teeth, or those on each side of the fracture, is unsatisfactory, in that the strain loosens the teeth and displacement is easily effected. The dental splints are the most satisfactory. If it is impracticable to have an

interdental splint, suture the fragments together after drilling through the bones—kangaroo tendon or silkgut (preferable to silver wire) immersed (1-20) in ethyl alcohol. When wanted at time of operation, remove with sterile forceps and place in water which has just been boiled and has been allowed to cool. Sutures may be removed as soon as union is secured.

Experience has taught, in this war, that in cases of septic compound fractures, it is dangerous to expose the wound. By means of an aseptic operation, insert into the bone, at a distance from the seat of fracture, screws which are long enough to project well beyond the surface of the skin and to immobilize the fragments by means of a rigid plate fixed to the screws by nuts, the whole operation being done without interfering with the original wound.

Compound fractures of the mandible are often difficult to hold in



Pte. Parsons. Kicked by a horse. Compound fracture of mandible Symphysis and Angle of jaw. Treated June 1st. Discharged from hospital five weeks later.

Bad fracture—many small pieces of bone—treated with sutures and external compress—eight weeks getting well.

good position. To a dental vulcanite splint should be added lateral arms of wire held in position by a posterior strap. A bandage is then passed under the chin between the wires and over the head and neck, and this steadies the jaw by upward and backward pressure.

In the making of a dental splint, impression is taken with modeling composition and plaster cast made from impression. The lines of fracture are indicated upon the plaster cast. With a saw, cut the cast upon these lines, and the lower teeth are articulated with the plaster model of the upper jaw. Cement is used to hold the sawed portions together. The fracture has thus been reproduced and reduced in plaster of paris. A vulcanite splint is made from this reconstructed lower jaw and applied to the teeth. The deformity is thus corrected and prevented from recurring.

Etherization will often be found necessary in the reduction. Frac-

ture of the ramus of the inferior maxilla is difficult to correct. The body of the jaw drops downward and backward and the ramus slides forward. No dental splint is practicable, because there are no teeth on one side for attachment of splint. An outside pad and chin-piece and elastic strap splint are used, also screws and plate, sutures, etc. The wound and fracture, at first, should be inspected daily to insure accurate adjustment of appliance. The mouth and teeth should be kept scrupulously clean. Use some mild antiseptic wash. Give liquid nourishment, prescribe outdoor exercise and plenty of sleep, and in some cases a tonic.

Abscesses which appear should be treated by incision and evacua-



Sergt. F. K. Cladingball, wounded, battle of the Somme—compound fracture mandible—lead ball entered back of neck about four inches from left ear, passed through under tongue—located with X-ray one inch from symphysis in neck to right. Removed ball July 5th—applied a modified form of Moriarty splint July 6th—before splint was applied was in great agony, could not eat or sleep—after setting jaw and applying splint pain subsided, and patient could eat and sleep. After reduction mouth was kept scrupulously clean—outdoor exercise, plenty of sleep, a mild tonic.

tion of contents by drainage. Bits of necrosed bone should be removed. I have got marvelous results from the use of pure ether. Inject about 3 c.cm. into abscess and infected bone. There will be a rapid rise of the pulse. This should occasion no worry, providing no more than 3 c.cm have been injected.

I am indebted to Capt. Andrew Croll, M.D. (Edin.), F.R.C.S., for information concerning ether treatment. Also to Professor P. Marlinier, Paris, and others, for knowledge of more recent oral surgery methods. There are a number of able men doing good work in oral surgery.

Capt. H. M. Holt, R.A.M.C., has rendered excellent service detailing steps, from "fluid" to "full" diet, massage and dynamic exercises, gradually bringing the injured jaw back to a condition which enables it to properly deal with everyday food.

Dr. O. Rubbrecht, Belgium, Professor of Stomatology, University of Ghent, has an excellent new method for treating fractures of the jaw. He is with the Belgian Red Cross.

The C.A.D.C. is doing good work and is much appreciated by officers and men of all units. The R.A.M.C. and C.A.M.C. have been most cordial and profuse in their praise of the good work we are doing. General Sir Arthur Sloggett, head of the Medical Service in France, personally congratulated me on the good work of the Canadian Dentists. He thought the dental methods in the treatment of fractured jaws marvelous.

I have been associated with four Field Ambulances, one British Casualty Clearing Station, and a General Hospital on the lines of communication. In every case I have met with nothing but kindness and appreciation from our brothers of the medical profession. I served five and a half months with a brigade of Field Artillery, like the M.O. of the brigade. The D.O. rendered service under fire.

France is a beautiful country. In musing one becomes romantic and remembers bon peuple de France associated with chivalry—loved by the unfortunate Mary Queen of Scots—the stage of the meteoric career of the great Napoleon. Contemplating the vicissitudes of men and nations, one is convinced there are better things in life than misanthropy and dollarism.

France, September 25th, 1916.

Oral Hygiene Reports

Philadelphia, Pa.—For the purpose of instructing the children of the city in the best method of caring for their teeth and to cut down the danger of infection through the mouth, the Philadelphia Association of Oral Hygiene is being formed. The object of the organization is to reach mothers and instruct them in the necessity of sanitary conditions of the mouth.

The organization has as its platform the plank that disease may best be combatted through oral prophylaxis and is seeking to have oral hygiene introduced into the schools as a part of the curriculum.

Kansas City, Mo.—An earnest protest was recently made to the Board of Health by Mrs. Herbert Allen, representing the Council of Women's Clubs, against delaying dental inspection in the schools, which had been in session six weeks.

Dental Services : Returned Soldiers

MAJOR J. G. ROBERTS, O.C.D.S., MILITARY CONVALESCENT
HOSPITAL, TORONTO.

THE Central Military Convalescent Hospital of Military District No. 2 is situated at 35 College Street, Toronto. To this institution all men, returning from overseas and who were enrolled in this district, report on arrival in Toronto. Some are discharged, while others are treated during their convalescence, and finally pensioned or discharged. All necessary operations and treatments are given these men. It is particularly of the dental service rendered that I wish to direct the attention of the members of our profession. As may be readily imagined, many of these soldiers have been on active service for a prolonged period. At the date of enlistment they were probably the best specimens of physical development in our land. In addition the mental development of many was of a very high order. They were men in whom we all felt pride. After the din of battle and the strenuous life on active service they have returned to us apparently many years older, with their nervous systems scarcely under control, and during the campaign they have had slight opportunity of performing a regular toilet and have given little, if any, attention to the oral cavity.

In the earlier periods of the war many soldiers were gassed. This unholy and unheard of substance produced a condition in the lungs and soft tissues that entailed a great amount of careful treatment. (It is conceded by eminent medical authorities that this class of patients should never have ether administered as an anaesthetic.)

Many men have heavy calcareous deposits around the necks of the teeth and extending below the gingival margin. The soft tissues are highly inflamed. When the physical condition of these men is considered, it will be readily understood that the greatest care and patience are necessary. Some cannot endure a longer operation than ten or fifteen minutes. Several require a large number of extractions. This class of work seems to be borne cheerfully under a careful and thoroughly inserted local anaesthetic.

A great number of the returned soldiers express neither fear nor objection to an operation. Some have had ten or more and have grown accustomed to anaesthetics. To the above must be added, great numbers who require dental fillings. All kinds of fillings are inserted. Where the patient has had gold fillings before enlistment, gold is used if advisable. Many restorations with synthetic are made in the anterior teeth. Amalgam is principally used in the posterior. Many of the returned soldiers require partial or full dentures. These are made and inserted free of charge to the men. Only teeth with

platinum pins are used. It is the wish of the hospital commission that every man shall be supplied with the best appliances obtainable so that he may be able to fill some position with credit and be independent of charity.

To the foregoing classes must be added those with contagious or infectious lesions.

The most prevalent is tubercular, while there are a few cases of positive syphilis.

The utmost care and precaution are necessary in treating these. Thorough and complete cleanliness and sterilization are observed and practised.

These men appear to improve in many cases, after their mastication has been restored and the tissues resume their normal condition.

The Radiograph shows very many cases of apparently highly skilled mechanism in attachments and bridge work to be very faulty. These are removed in many instances before any improvement is noticeable. This is practically true in rheumatic conditions.

I cannot voice too strongly an objection to one tooth or one abutment carrying the stress and burden of two or more. The condition around these roots is always congested if not worse. Experience shows that where this condition exists it is only a matter of time until these fancy appliances must be removed. Physicians of to-day have access to the Radiograph and suggest the removal of the cause of such conditions. They are quite right in the main.

To the above classes must be added the treatment necessary where insertions of bone have been made. Some cases of a part of the lower jaw being fitted with bone from the leg or rib. Here, stays and supports must be devised, placed, and retained in position for months, and the oral cavity kept in a healthy condition for this prolonged period. It can be readily understood that the work at this institution is varied. There is almost everything known to dentistry here. This work is very interesting to those in charge of this branch of the service.

Many of these soldiers have given most of their physical energies and the best of their lives in order to preserve the British Constitution and all that it stands for. They are amongst the grandest, most noble and the best manhood of our Empire.

They have done their bit. Many of them have looked into eternity, but through careful nursing and treatment they are now convalescing, and will in a measure, be able to take a place in the developing of this great country. These men are most cheerful and appreciate every little kindness or attention that is given them. I may point out this common expression amongst the returned veterans: "God bless the women of England."

Kindness has filled their hearts to overflowing and they speak out. If this be Tommy's opinion of the English women, let the women of

our own fair Dominion redouble their efforts and be worthy of the same praise.

Many of our own fair sex are practising those Christian virtues in a marked degree. Our country will be improved spiritually and morally if every woman do her duty and take a real interest in this noble work. These men, as well as every man who dons the King's uniform, are justly entitled to our best efforts in every possible way. Kind words and kind acts are never forgotten. A word or a nod of recognition costs little, but means a great deal to a lonely and perhaps a friendless soldier. Very many civilian dentists have volunteered their services to the officer in charge. This is just what we would expect. There should be the utmost brotherly feeling in this work. Our establishment is coming along slowly, but just recognition of the benefit of our services is noted by the military authorities throughout the Dominion. To the members of the profession who have autos, I would suggest that you take a half day off frequently, fill your car with these men and give them an outing. Talk to them. Interest yourselves in them. You will feel better and so will they. Remember Nelson's motto: "England expects that every man will do his duty." This is the time and here is *your* chance.

The C.A.D.C. in Military District No. 10

MAJOR W. W. WRIGHT, A.D.D.S., M.D., No. 10.

“ONE of the most important branches of the whole Army,” so said Sir Sam Hughes as he passed through the lines inspecting the Dental Corps during the review of 25,000 troops this summer at Camp Hughes; and we officers and men of the C.A.D.C. agreed with him to the fullest extent. We had reason to know. We had figures to prove that if they took the dentists and their assistants out of that army, then ten per cent. of the others must necessarily follow. We were glad that our services were appreciated so well by the head of the Canadian Army. We marched past afterwards, in column of platoons (three platoons—one each of officers, sergeants and men) and our hearts beat faster when the General again expressed his appreciation, “Fine; Fine!”

However, we did not feel that we were particularly proficient with that kind of “drill,” having had many misgivings as to what kind of a showing we would make beside men whose business it was. We could have felt much more at ease exhibiting our skill with another kind of “drill,” which most Generals prefer to have done “in private by officers.”

We then had a strength of twenty officers and nearly fifty N.C.O.'s and men, whereas a year previous there was one officer and one man



MAJOR W. W. WRIGHT, A.D.D.S., M.D. NO. 10,
Canadian Army Dental Corps. Born Nov. 14, 1882, at
Emerson, Man. Educated at Emerson Grammar and High
School. Taught school, 1900-1903. Graduated, North-
western University Dental School, 1906. For two years was
President of Winnipeg Odontographic (now Dental) Society.
Enlisted C.A.D.C., Dec. 1st, 1915.

on duty in Camp Hughes. The Corps had been growing rapidly and moved into Camp determined to stand on its own feet. We have continued to stand. The problems of cooks, messes, rations, helpers, guards, etc., were successfully coped with. Fortunately a good location had been secured and very shortly a baseball team entered the league (kindly permit me to omit the final standing of same), and two tennis courts were established, which were much used and are still affording amusement and recreation. Often has the banjo in the hands of our colored cook "Henry" been the centre of an evening's sing-song. Henry is only six-feet-four-inches and weighs 214 pounds, being ready and willing to let you practise on him with the gloves. You see, you could never tell when you had given Henry a black-eye, and it would not have made any difference if you could. Henry is "some cook."

From the time Camp opened in the beginning of June till harvest leave started, August 15th, the Corps was simply overwhelmed with requests for services and there was so much asked for that what we were doing, seemed insignificant. The figures of work accomplished told us we were doing a great deal of work, but the demands for more services than ever made it difficult to feel that we were coping sufficiently with the situation. However, with harvest leave, came a breaking spell and an opportunity to better our system of looking after the men. We were working a departmental clinic consisting of four

departments—namely, (1) An examining department where all patients first reported and had history sheets made out; (2) an emergency department where two or three operators gave their entire time to relief and extracting; (3) an operating department for treatments and fillings, and (4) a prosthetic or plate department. The operators were changed to the different departments at regular periods. This plan had worked well when we had a smaller clinic in Winnipeg, but it was unsatisfactory for several reasons under the conditions in Camp. So we changed to what has proved a much more satisfactory plan. Battalions or Units were assigned to certain operators and each operator looked after his own Unit, doing all the work for each of his patients. Three additional chairs were set aside for impression work. The above plan has proved so satisfactory to both Units and operators that we do not feel it can be improved on; but we are ready, nevertheless, for suggestions. The Officer Commanding met the officers, sergeants and men separately each week and discussed their particular work with them.

The Dental Corps has always attended Church Parade as a Unit.

Unfortunately we were unable to secure very much in the way of a building at Camp Hughes, partly due to the feeling that next year the new district, M. D. 12, would have a separate Camp of its own and smaller quarters would then be sufficient here. The building accommodated eight chairs, in addition to the quartermaster's stores, the orderly room and the O.C.'s office.

Two marquee tents are in use for operating rooms, another is used for laboratory and another for waiting room. The canteen, officers' mess and sergeants' mess are in marquees, and a large tent is in use for the privates' mess, so that we have nine large tents in use besides twenty-four bell tents. There is no electric power in Camp so the old reliable foot engine is ever at our side and the sergeants are now expert with the foot-lathe. The building and one of the operating tents is provided with hot water on tap, the rest cold water only, so that we use kerosene and gasolene heaters. Fountain cuspidors are



Shows two platoons going through, "Getting Dental History Sheets Made Out."



A group snapped just after a lively rain and wind storm.

out of the question—verily, we are in Camp and ready for any kind of a camp elsewhere.

With an eye to what might be expected of us when Overseas our Commanding Officer arranged for some special training. A class was organized in Winnipeg which spent one night each week in the dissecting room in the Medical College in order to freshen their memory on the anatomy of the head and neck. Dr. Rondeau, who was then a demonstrator to the medical students, very kindly consented to act in that capacity for us. In September this year the officers extended an invitation to Prof. Griffiths, of the University of Minnesota Dental School, to spend what time he could with us, offering him as a recompense the huge sum of NO dollars plus his expenses. Prof. Griffiths is well known in the Twin Cities and the Middle West as an authority on conductive anaesthesia and as a skilful operator. He comes of British parents and British blood is in his veins, and when this opportunity came of doing "a bit," he gave us a week of his valuable time. One of the officers expressed the feeling of all in regard to Prof. Griffiths' visit by the words, "It was worth the whole summer in Camp, just that one week he gave us." Since then our operators do not hesitate to inject for sensitive teeth, root-amputations, impacted molars, devitalization or block off a field by one or two injections for several extractions. As a man and as a dentist Prof. Griffiths has a high estimation among the dental officers at Camp Hughes.

We did not care to mention how our baseball team fared, but we would like to shout from the house tops the fact that the C.A.D.C. made the highest average of any Unit in Camp at the rifle butts. In

an officers' competition recently Capt. Sinclair made 26 points out of a possible 28, and the five officers in the shoot made an average of 22. If the time comes to lay down our chisels and forceps and fight, the boys here can give an account of themselves with the rifle.

Camping here is not all pleasure. We have had several storms, three particularly violent, the first of which levelled every marquee in our lines, doing considerable damage and leaving about an inch of sand over everything. During this storm one of our colored cooks was discovered clinging frantically to the cook house and singing, "Is my name written there?"

This little sketch would be incomplete if mention were not made of the Ladies' Auxiliary, an organization in Winnipeg of dentists' wives, and of wives and lady friends of the C.A.D.C. These ladies organized themselves for the purpose of procuring things for the Dental Corps which could not be procured in the ordinary way, and to minister to the comfort of the N.C.O.'s and men, both here and overseas. Recently when a draft of officers, sergeants and men proceeded overseas each group found itself in possession of a hamper and reading matter, the gift of the Ladies' Auxiliary; the hampers contained home-made candy, cigarettes, socks, handkerchiefs, and a beautiful little testament for each. Some of the things which they procured for the clinic use were:

- 100 khaki operating coats.
- 50 aprons for the mechanics.
- 200 towels.
- 6 laundry bags.
- 24 roller-towels and sleevelets.



"Hun Hunting" leaves no time for "Duck Hunting," the favorite pastime time of O.C. and several other officers of the C.A.D.C.

Now they are preparing for the next draft, which is leaving shortly, for Christmas Greetings for those overseas and for a fund for comforts for next summer's Camp, if necessary.

Recently the fourth overseas draft proceeded overseas. There was great joy among them when they received the warning, as they had all been on duty since last December, and were anxious to get overseas into "real work." The officers in this draft were as follows: Captains G. A. Munroe, Saskatoon; W. S. Holmes, Prince Albert; L. D. Steele, Regina; H. C. Jeffrey, Carberry, and N. S. Bailey, Portage la Prairie. The parade to the station consisted of the 184th battalion band, the draft, followed by the other members of the Corps. Major General Hughes was present and spoke a few words of appreciation and encouragement; then followed hearty cheers for the General; for the 4th Overseas Draft; the train came in; the band played, "Keep the Home Fires Burning" and "Auld Lang Syne," and the boys were off. Now a fifth draft of nine officers, nine sergeants and nine men, is preparing to go shortly. The following are the officers on this draft: Captains, B. S. Bailey, D. A. P. McKay, A. W. Myles, M.P., F. G. Moore, R. S. Rose, J. A. Stewart, H. V. Schwalm, R. J. Yeo, and J. G. O'Neill

The dentists of this district have volunteered well. In Manitoba alone, of less than one hundred and fifty dentists all told, thirty are in uniform, most of whom are in the C. A. D. C.

The following figures from the last Quarterly Report will indicate the amount of work done in this District. During September and the latter part of August most of our troops were away on harvest leave, consequently less work was done:

Filling: Amalgam	3,141
Gutta Percha	66
Cement	1,336
Root	825
	—————5,368
Total Dentures and Repairs	1,082
Total Operations	18,918

Dental History Sheets were made out for fifteen battalions during the 3rd quarter, 1916.

Our large clinic affords us many opportunities of seeing interesting cases and of discussing with each other the best treatment. Special mention might be made of a bi-lateral fracture of the lower jaw, which healed by first intention, much to our satisfaction; and of ten cases of ulcerative stomatitis nocens (Marshall), an infectious disease which we were able to control and prevent from spreading.

As an educational factor to the general public of the value of dentistry one need not hesitate to state that it has been one of the greatest boosts that oral hygiene has ever received or ever will receive.

Minister of Militia Praises C.A.D.C.

THE following article appeared in the *Mail and Empire*, Toronto, Friday, October 20th, 1916, and clearly indicates the attitude of the Minister of Militia toward the Canadian Army Dental Corps:

DENTAL GRADUATES FOR OVERSEAS.

Students Who Took Special Summer Course Offer Their Services.

Men Will Be Granted the Provisional Rank of Lieutenants.

The Board of Directors of the Royal College of Dental Surgeons of Ontario, is now in session at the College Building, Toronto, the following members being present: Dr. W. C. Davy, Morrisburg (president); Dr. M. A. Morrison, Peterboro; Dr. W. C. Trotter, Toronto; Dr. Donald Clark, Hamilton; Dr. W. McGuire, Waterford; Dr. A. D. A. Mason, Toronto; Dr. H. R. Abbott, London.

The board is holding a special meeting to consider the examination results of the students attending the Summer session. This special session was conducted at an approximate cost to the Dental College of \$10,000.00 and was undertaken for the purpose of hastening the graduation of the two senior classes of the college, and thus preparing them for overseas service as dentists.

Dr. Harold Clark, of Toronto, left for Ottawa on Wednesday night, representing forty members of the graduating class, and discussed with the Minister of Militia the signing-up of these graduates as lieutenants in the Canadian Army Dental Corps.

There have recently been drafts made for this corps overseas amounting to seventy-five graduates and seventy sergeants.

Message From Sir Sam.

The following telegram was received last night at the college from the Minister of Militia:

"Ottawa, Ont., Oct. 19, 1916.

"Dr. Wallace Seccombe,

"Royal College of Dental Surgeons, College Street, Toronto.

"Major Harold Clark has represented to me your endeavors, on behalf of the Canadian Army Dental Corps, to furnish us with officers. We will accept, as has been the rule, such of your graduates as may be required for our service, giving each, upon confirmation, the rank of lieutenant. Pending confirmation, however, the rank will be temporary, or provisional, for a couple of months. Permit me further to express my appreciation of the interest shown by dental profession

of Canada in furnishing our forces with such a self-sacrificing, capable lot of dental surgeons. Their great work is appreciated not only by myself, but by all our officers, non-commissioned officers, and men, more especially the gallant boys who are daily facing the enemy in this great struggle. Canada has given an example in this dental matter upon which Great Britain, France, Italy and Russia have been pleased to model. Kindly convey to your associates throughout Canada our high appreciation of their disinterested services in the cause.

"SAM HUGHES."

AVAILABLE FOR SERVICE.

In addition to 65 junior students, 53 seniors attended the special Summer course, and the latter will now be available for army service in the Dental Corps.

The members of the senior class are:

William Wilfred Astle, Frank Bechely, Ariel Edwin Benson, Roy Wellington Blackwell, Robert Muirhead Box, John Douglas Brown, Joseph William Earle Brown, Alvan Elmer Cavanagh, William Chartrand, John Warren Coates, Charles Russell Collard, Heber Leon Coursier, Arthur Laughlin Crozier, Lewis R. Davison, Franklin Murray Deans, James Emmanuel Eugene Does, Wallace Roy Elgie, Eldon Winger Eby, Harold Grant French, Colwell Campbell Graham, Milton Henderson Hagey, Oliver Hart, Russell Weir Hoffman, Harry M. Katzenmeir, Robert Ross Larmour, George Arthur Lee, Clarence Howard Lipsey, William Alfred Loveridge, William Campbell MacLachlan, Ross V. McLaughlin, Roy Aberdeen McCormack, Kenneth McDowell, Harry L. McNally, Ernest Jason Oliver, Charles M. Porter, Melvyn Gordon Robb, William Hudson Scott, Richard Albert Sheehy, William Stewart H. Sinclair, Harry LeRoy Smith, Harold Ebenezer Smith, Leonard Stanley Smith, Lloyd Reuben Stedman, Ray John Stone, Robert Frank Taylor, John Whitlock Turner, Albert Garfield Wicks, Erle Franklin Whaley, Roy Osborne Winn, Russell Clifford Wood, Robert Davidson Wallace, Cyril Fallis McCartney, Ross Hamilton Wing.

The following telegram was sent Sir Sam, in acknowledgment of his message:

Toronto, Oct. 25th, 1916.

The Honorable Sir Sam Hughes,
Minister of Militia,
Ottawa, Ont.

Board of Directors, Faculty, and students of Dental College extend sincere thanks for interest and consideration. The Dental profession not only gives you credit for organization of Dental Corps but realizes that your work will give you an honored pioneer's place in the history of the Dental profession.

Royal College of Dental Surgeons.

HORTICULTURE AS A HOBBY FOR THE DENTIST

FRED. G. BRETHOUR, D.D.S.
Spadina Ave. and College St., Toronto

ORAL HEALTH WILL BE PLEASED TO HEAR OF HORTICULTURAL
SUCCESSSES OR FAILURES AND OF YOUR GARDEN PLANS FOR THE
FUTURE. SUGGESTIONS OR QUERIES WILL BE GLADLY RECEIVED
FOR DISCUSSION IN SUBSEQUENT ISSUES.

Irises

WHO can imagine a perennial border without the Iris? It is possible to make a border of Irises alone, and have bloom almost six months in the year, there are so many species of them. Some of these are very difficult to grow, some are very easy, and it is two families of these latter which I am going to write about. The first is the "Flag" Iris, (miscalled the German Iris or Iris Germanica), which is not a native of Germany, and the other is Iris Laevi Gati, or I. Kaempferi, or the Japanese Iris.

The Flag Irises are distinguished for their vigorous growth, their decorative foliage, and their beautiful orchid colored flowers. They are an exceedingly fascinating species, and lend themselves excellently to the hybridizer. So many beautiful varieties are introduced every year, that what were considered choice even a few years ago, are now being discarded. These plants consist of what is called a rhizome, which is in reality a creeping stem thickened and with power to throw out roots, leaves, and buds. A plant once established increases at an enormous rate, until you have a huge twisted mass, partly showing above ground. These huge masses should be dug up, divided and planted in new ground to give the best results. The Flag Iris can be planted at any time, so long as the ground is not frozen-up. In fact, they are almost fool-proof, for it is very hard to kill them. The best time to plant is just after they are done blooming, for there is then, apparently, a short period of rest. Like most plants they have two sets of roots, one lot of which grows downward. These hold the plant firmly in the ground, and the other set creep along just beneath the surface. These produce the flowers. It is necessary then to get these roots nicely established before winter sets in to insure flowers the following spring. However, spring planting, as soon as the ground is workable, will often produce flowers in May.

I said that these plants were almost fool proof, but there are one or two things they do not like. The first is, they don't like wet feet.

so you must have good drainage. A good sandy clay loam just suits them. Borders should be at least a few inches above the level of the ground and that will insure against standing water in early spring. Another thing they don't like is too much shade. They will grow all right but they won't flower well, for the rhizomes like good scorching sun baths. Do not, therefore, plant anything near them which will hide the rhizomes from the sun's rays. Perhaps I might mention a third thing which they don't like, and that is a quantity of manure of any nature, too near the rhizome. This induces rot, so in planting, look out for that.

Now as to the method of planting. Prepare a hole big enough to accommodate the roots when stretched out. Hold the rhizome so that when it is covered it will be just below the surface. Sift the earth carefully around the roots, and firm it. If you cover the first winter, leaves are preferable. The ground which has been previously prepared, as directed, will be fertile enough for a year or two. Afterwards, if you wish to fertilize, bone-meal, and sheep manure, just merely stirred in under the surface, is very good.

Flag Irises are divided into a number of classes, but for the ordinary amateur it is sufficient to know whether they are early, middle or late; whether they are tall, intermediate or dwarf; and also whether they are blue, pink, yellow or white. I think the most satisfactory arrangement is to have a group of one color or of harmonizing colors, and of the same height, or at least of properly graded heights, and of same time of blooming. A long border of Irises also looks well with daffodils (for early bloom) planted near them, and with a shrubby back-ground or a hedge, or with a group of Lupines, makes a great show.

Among some of the beautiful varieties of Iris are Pallida Dalmatica, Rheinix, Her Majesty, May Queen, La Caterina, Oriflamme, Nothung Fro, Eldorado, Alcazar, Montsignor, Princess Victoria Louise, Prosper Langier, Edward Michael, Parisiana, Isolene, Ambigu, Opera, Miss Willmott, etc. Some of these are very hard to get as yet in this country, but they are all on the market and the prices are from 15 cents a root to \$2.00. The above includes about all colors. For instance, Eldorado is described as Standards, and Falls, elusive rosy bronze, shading to mauve, with fire of an opal, and this certainly does not exaggerate, for I had it in bloom last May and it is really beautiful. La Caterina grows from four to five feet high and is a huge flower of clear blue and soft lilac. The best thing to do is to get an Iris catalogue and study it.

As to the blooming period of this species of Iris, it commences about the 20th of May and lasts for a month. For cut flowers they are very fine. They open better and look much better indoors than out. The perfume of some of the varieties is very sweet. Cut the flower stalks as the lower bud begins to open, and as fast as one flower fades



Japanese Iris

the next one opens, providing you change the water and nip off a little piece of stalk every day.

The other family of Irises, the Kaemferi, or Japanese, are also rhizomatous, but they belong to the beardless group or Apogons. The former or Pogoniris have a beard down the centre of the "fall," while the latter group has none. These also have flat flowers, differing considerably from the Flags, which have upright segments (standards), and lower drooping ones (falls). If not so attractive in shape, they are as rich or richer in color and as for size, they are sometimes as large as a dinner plate, but ordinarily five or six inches broad. This section of Irises also has different tastes from the former. They love cool, moist places. You cannot give them too much water and they love to go to sleep with wet feet. Still they do bloom even in such surroundings as the Flags, but during the time they are in bud, it is well to give a liberal supply of water. A very good plan is to sink an ordinary drain pipe between the clumps and fill this up with water every day. They are in their glory along the edge of a pond, and as they bloom in July their gorgeous flowers help to give that continuation of bloom which you must have in your garden. These should also be planted soon after flowering, but they can be planted any

time in the fall, or even in the spring. They also are very fine for cut flowers and last well in the house. Plant these in groups by themselves. They are ideal, of course, at the foot of a fountain, or at edge of pond, but with a good heavy clay subsoil, which retains the water, you can have good success in semi-shady places in your border.

Annual Conference of the Ontario Oral Hygiene Committee of the Ontario Dental Society

THE Annual Conference of the Ontario Oral Hygiene Committee will be held on Tuesday, November 21, 1916. At this date reduced railway fares may be secured on account of the Convention of the Ontario Horticultural Society.

Part of the program will have special reference to the mode of carrying on Oral Hygiene work in districts outside of the large cities. The subject will be presented by one who has special qualifications for offering suggestions regarding the best means of carrying on such a propaganda,—Inspector Taylor, of St. Thomas. Mr. Taylor was at the Oral Hygiene Conference last year and is impressed with the importance of the work, as it affects our national vigor.

Last year Dr. F. E. Bennett, of St. Thomas, set a good example by bringing with him to the Conference, School Inspector Taylor. The Executive invites all who can, to bring with them the school inspector of their district, and assures them a hearty welcome.

Special notice will be sent to those who are known to the Executive to be interested in Oral Hygiene education. Those reading this notice who would like further information, can have it by applying to the Secretary of the Committee, Dr. N. S. Coyne, 533 St. Clair Ave., West, Toronto.



THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

INSERTING DENTURES IMMEDIATELY AFTER EXTRACTIONS.

IN many vocations success depends upon one's resourcefulness. Dentistry furnishes many striking illustrations of this fact. Few of our tasks are similar, each patient has, we say, individual peculiarities. These must be recognized in our methods of treatment. In cases where no fixed rule is applicable, resourcefulness is the saving quality.

Take as an example the patient whose teeth have been so neglected as to require extraction and who by reason of his occupation, etc., does not wish to go about without some sort of a substitute after extraction. What can be done for him? There is the so-called temporary denture to which we commonly have recourse, but as this is built up on an impression of the mouth, taken after the extraction, some delay is occasioned. Another method, and it is not a new one, is to take the impression and complete the case before extracting the teeth. The denture is inserted immediately after the teeth have been removed.

For those who have never tried this method, and indeed also for those who have become acquainted with it, an article appearing in the *British Journal of Dental Science* (Aug.), by Isidore Clifford, L.D.S., Eng., will be of interest. His method is to secure the impression of the mouth before the extraction, and carve the model to the shape he thinks the mouth will assume after the teeth are removed. The artificial teeth are waxed up on this modified model and the case completed in the ordinary way. After the teeth have been extracted and all aseptic precautions taken, the completed denture is inserted. It is found that the pressure of the denture aids in arresting the hemorrhage consequent upon extraction and also prevents the patient touching or irritating the wounded gum tissue with the fingers or the tongue. A certain freedom from infection of the sockets obtains because particles of food cannot get into them. The author recommends that the denture be not removed for at least twelve hours after first inserting, as the blood clots under it seem to have a most bene-

ficial effect on the gums. The freedom from pain, inconvenience and soreness of the gums is extraordinary. "The patient has seldom to come back for even slight attention before the permanent case is made."

Another claim for this method, and it is one that appeals very much to the operator, is that the gums heal rapidly and assume an arch or saddle shape which proves very satisfactory for the permanent denture. The author states that in many cases the patients have been able to masticate at once with these temporary dentures.

In preparing a denture in this way, the vulcanite must be carried high up in front of the gum and the teeth placed at the edge, not in the same position as were the natural teeth. This, the author states, does not as one might suppose, cause the lips to project uncomfortably. "I adopt the same plan for the upper and for the lower jaw, and all round the mouth carrying the vulcanite well up outside the gums. In cutting the teeth off the model, I do not cut them quite down to the level of the gum, but leave them shaped to the form I want the gum to assume, and I also paint some soft plaster of Paris on them to build up the shape. In that way room is left for a little swelling of the gum after the extraction."

Two models of the mouth before extraction are obtained, one being used simply as a guide while setting up the teeth. On the other model the teeth are cut away, a few at a time, and artificial ones set up in their place, then a few more are removed, continuing in this way until the entire case is arranged.

When the denture is inserted after the extracting is complete there is little bleeding of the gums, says the author. "My view is that the gums swell and the plate acts as a compress. In no case where I have adopted this method has there been any bleeding, except for a few minutes. I cannot lay too great a stress on the advantage of covering the open sockets at once and in that way preventing any foreign matter intruding. The rapidity of the healing is astonishing. In twenty-four hours, as a rule, all the sockets are quite closed; of course the recession and absorption go on in the usual way."

BRUSHING THE TEETH—A NEW METHOD.

In many dental journals the method of cleaning the teeth has received important attention. Dr. Henry Barnes, in the *Dental Register* (July), says that the manner of using the tooth brush has much to do with its efficiency, and suggests the use of "a specially designed brush without the accompaniment of abrasive or detergent tooth toilet agents other than water alone." The author is fearful lest the prevailing system of brushing the teeth after meals "with regularity and vigor, to say nothing of stiff bristles and saponaceous powder, paste or liquid" may become in reality a means of tooth destruction rather than a method of tooth conservation. He be-

lieves "that the prevalence of various ills of tooth and gum preliminary to and including pyorrhea is due in a large measure to prevailing tooth brushing practices, and that these maladies can be relieved and prevented by reforming these customs." He would substitute for the brush consisting of several rows of stiff bristles, one containing only a single row of softer and finer bristles, and in place of the present method of brushing the teeth with a vertical, lateral or circular motion, he would have us brush always in a direction away from the gums and towards the edge of the teeth, "employing the sides rather than the ends of the bristles in a sliding stroke."

The brush recommended is small and narrow, having but one row of bristles, which are fine and set in small bunches. Each alternating bunch is cut low so as to present a serrated form. This permits of the bristles passing readily into the proximal spaces and all irregularities of the teeth.

Dr. Barnes gives the technique for handling the brush. It is indeed very elaborate. A new position for the brush and a new motion of the arm and shoulders is given for practically every surface of each tooth. Those who are expert in mastering details of position, speed, pressure, etc., will find ample opportunity for displaying their talent if they will but learn Dr. Barnes' method.

ROOTS AND THEIR TREATMENT.

In discussing this subject Dr. Walter F. Provan, in *Dental Summary* (Aug.) suggests that it ought to be taken as an axiom that the radiograph should be employed in all cases where treatment of complex conditions of roots and canals is to be carried on. He says: "Without a good X-Ray picture we can only conjecture at conditions surrounding the root apices, and even with long experience we must, in the nature of things, make many mistakes in diagnosing these cases simply by external symptoms. A sinus may discharge several teeth away from the root on which the infection is located, and it is only by a good skiagraph that this condition can be located and quickly traced. It will also show the feasibility of treatment or non-treatment where the area of absorption is merely a rarefied space in the alveolar process, or an actual hole into which the root end is projecting."

The author looks forward to the time when the public will not accept the services of a dentist who undertakes to cure abscesses without seeing the conditions present at the apex of the infected tooth. The fact that the swelling has disappeared and the tooth stopped aching ought not to be taken as a sign of the favorable issue to the treatment, because we know that the X-Ray may show an infected area still persisting. The blood stream may carry infection away from this region to other parts of the body.

Dr. Provan, speaking of his method of ascertaining the length of the root, says: "When there is no rarified area, when one has a good picture of the tooth to be treated, he can measure the length of the root and tell just how far his broach must go to get to the apex. One good method is to open up the canal as far as possible without danger of perforation and seal in a sterile broach or piece of wire; then take your X-Ray picture; then if there is no distortion in the film, the length of the sealed-in broach is to the apparent length of the broach in the picture, as the length of the root is to the apparent length."

In opening up the canals, Kerr root files are used in place of reamers. Small files are first used and the size gradually increased until the canal is enlarged as desired. While filing, peroxide of sodium is used in the canal and this leaves it very clean. "Push the file in until it engages with the side of the canal, take one turn and draw back, wash the file in either H_2O_2 or concentrated benzoic acid solution and again place in the root canal. It is surprising how quickly and well the root canal can be cleaned in this way. By my picture I can tell how far my file must go before it comes to the apex. In curved and malformed roots which can be filled, the fine file will follow the curves if used as above, and will not perforate the sides of the root; the next sized file will follow the first, etc.

If the picture demonstrates the existence of rarified areas or actual holes in the process a surgical method of treatment is preferable to any medicinal one. Extraction or apicoectomy are called for when the end of the root is seen to protrude into the hole. The objection to the surgical method of treatment is that there is a likelihood of the tooth so treated being lost, in course of time through the absorption of the root. "Even so," says Dr. Provan, "we would at least then have put off the wearing of a plate or bridge eight or ten years."

When root amputation is to be resorted to, the following technique is followed by Dr. Provan: "The instruments that I use are two sharp lances, one curved and dull on the convex side, and the other an ordinary scalpel and gum lancet, a pair of cotton pliers, a large, sharp, round bur, a pair of small scissors, and a pair of pliers notched at the end, for holding tissue which it may be necessary to cut away. A curette is necessary, but the curettes for sale at the dental depots are too large; so I use either Nos. 2 or 3 eye curettes or one of Black's straight spoon excavators, No. 33. A very fine sterling silver eye probe is also useful, for it is soft and will follow a pus pocket or sinus well. Some sterile gauze sponges or cotton pledgets are necessary to wipe blood from the wound. It is well, also, to have some sterile silk for sutures, with curved needles; the straight cannot be used in this situation. I use twisted silk, No. 5. A tube of Johnson and Johnson's iodoform gauze, 5 per cent., one-half inch wide put in glass tubes, also is necessary. These articles, with a bottle of tincture of

iodin and some Dobell's solution or sterile water for washing out the incision are all that are required."

Conductive anesthesia (novocain) having been obtained, the area to be opened is painted with iodin, and a crescent-shaped cut is made on the gum over the area to be exposed. The periosteum is cut through and turned back with the straight Black excavator. If a sinus is present, entrance is made through it. Otherwise the point of opening is determined from previous study of the X-Ray picture. The alveolar process is opened into by means of the large round bur. The root is then amputated. Root-filling may be resorted to at this time. The wound is then washed with Dobell's or Lugol's solution, painted with tincture of iodin and either packed with iodoform gauze or sewn up.

When filling canals at the time of the amputation, Dr. Provan proceeds as follows: "Stop the bleeding and clean out the canal; then place a piece of sterile cotton in the incision and against the amputated end of the root; flush the canal with acetone and dry out with a root canal dryer. The root can be filled now with any of the hard root canal fillers."

Taking up the question of root canal filling material, the author suggests for molar teeth or in roots to be crowned, oxyphosphate of copper cement. As it has the effect of discoloring the teeth it should be used only in those sections where color is of little consequence. Gutta percha points dipped in chloroform are used in the anterior teeth.

When it is necessary to devitalize the dental pulp, the author uses in most every case novocain injection. He reports little difficulty with the upper teeth, but "in cases involving the lower jaw it is quite often a fact that the teeth are not anesthetized sufficiently to get to the pulp. It is quite difficult to follow the technique given for mandibular injection, as to injecting one centimeter above the last molar. Many times the last molar is missing. I have adopted a method which seems to bring almost uniform success, and that is to find the external oblique line, then after preparing the mucous membrane with iodin, I find the angle of the jaw on the outside with my fingers and note the tragus of the ear; half way between these two points in a vertical plane is the point of entrance for the needle. Then follow back just a little from the bone to avoid injury to the periosteum, until the needle comes against the inwardly curving, ascending portion of the ramus, withdraw slightly and inject." Where insufficient anesthesia is obtained by this means a second injection is not to be used, but rather a novocain pluglet with pressure.

It is claimed that oftentimes root amputation will result in many teeth that have for a long time been loose and sensitive through abscessed condition, becoming firm and useful.

AMALGAM.

An article under this title by Dr. Marcus L. Ward, appearing in the *Journal of Allied Dental Societies*, commands attention as being written by one who has made long and careful study of this important subject. The author treats of an old subject in an entirely new way. Each of the principal makes of alloys is spoken of, their ingredients mentioned, and the particular work for which each is suited, mentioned. Dr. Ward was prompted in his investigations because he finds that "from the text books and current literature on operative dentistry one can get opinions that are very confusing, so much so, in fact, that it is practically impossible for one to get much of an idea of the subject without knowing the writers and their reasons for their assertions. This condition of the matter relative to the question of amalgam, both from the standpoint of the current magazine and the text books, furnishes a situation so complex that the average dentist cannot hope to make selections for his practice from the literature with any degree of satisfaction."

Taking up the question of zinc in alloys, the author, after careful experiments or observation, finds "that alloys containing small percentages of zinc are not very objectionable because of the zinc unless they are coarsely cut or imperfectly annealed or both." Dr. Black's position, as opposed to the use of zinc in so small a quantity as one-half per cent., is noted, although Dr. Ward can find no explanation given of his position in this matter. The present objection to the use of this metal is, thinks Dr. Ward, due in a large measure to the earlier criticism by Dr. Black. It is pointed out that "a great concern like the Caulk Co., with money and talent to investigate any problem they choose, place in a conspicuous place on their package of their leading alloy the statement that it is balanced with zinc." It is probable that science has overcome the objections raised by the early investigators. Dr. Ward sums up the situation in these words: "It may be passed at this time with the statement that the consensus of opinion, both among the most competent manufacturers and those outside the manufacturers is, that the high percentage silver, quick setting alloys are better with a small percentage in them than without zinc at all."

Turning to the newest idea in working amalgam—the Harper Method, Dr. Ward finds that the advocacy of mixing and packing the amalgam in a sloppy consistency is contrary to the accepted methods of handling this material. The technique advocated might be suitable for the most rapid setting alloys, of which Dr. Harper's is one, or such other alloys as Twentieth Century, Fellowship and several others of their class marked "rapid setting." Dr. Ward says: "I believe that for all medium and slow setting alloys the method is not applicable at all. I can understand why Dr. Harper should need plenty of mercury in his alloy while packing it in order

to get a tight filling, because it sets so rapidly that it needs to be slowed up a little and made more plastic, though this should be done in other ways if the least volume change is to be obtained."

A warning is given against being overly zealous in discarding old and tried methods for something that is widely different. In this connection Dr. Ward says: "There are no new alloys in the market that have a greater number of desirable properties than some of the older ones." Again he would "like to reduce the tendency to sacrifice time-tried methods and materials for something accompanied by catchy advertising." Further on in his paper Dr. Ward suggests, "that we get away from the inclination to adopt any method or material that is widely different from the ones we are using, if they are serving us and our patients well, until we are satisfied that they are better than the ones now in use."

The efficiency of copper amalgam as a filling material calculated to save teeth from the ravages of caries is recognized. It is unpopular, however, owing to its unsightliness and ill-tasting properties. There are a few alloys, however, containing copper, but not enough to make the filling darker, and these have some virtue as an antiseptic. An alloy of this type might be said to occupy a position midway between the copper amalgam and the lighter-colored amalgam alloy. Flagg's Submarine alloy is given as an example of this class, and is found to contain silver 60.00%, tin 35.00%, and copper 5.00%.

Of late years a class of amalgam alloys known as the light colored amalgams has been extensively advertised. Dr. Ward, in treating of this class, makes a division: the first including the high percentage silver quick-setting alloys, and the second, the low percentage slow-setting alloys. Of these he says: "The former class is composed of from 65.00% to 68.00% of silver, 26.00% to 28.00% of tin, 3.00% to 5.00% of copper and 0.50% to 2.50% of zinc. The latter class is composed of about 2.00% of zinc and the silver and tin about equally divided." As illustrating this class of alloy, Rutherford's No. 12 is quoted. This is composed of silver 49%, tin 48% and zinc 3.00%. Some manufacturers incorporate a small percentage of gold in order to impart a desirable lightness of color to their alloys. As representing this class Rutherford's No. 1 may be quoted. It contains silver 60.00%, tin 35.00% and gold 5.00%, or his No. 3, which is composed of silver 60.00%, tin 33.00%, gold 5.00% and zinc 2.00%. Dr. Ward finds that although a pleasing color is obtained with these alloys, that "their strength is not quite as high as the class represented by the Twentieth Century. Besides the objection to their being a little weaker, they usually have slight shrinkages if they are really old and fully annealed unless there has been placed in them above 65.00% of silver. If, on the other hand, they are not very old they make pleasing amalgam inlays, first because when polished they retain a good color; second, because they set a little

slower as a rule, which gives the operator a little more time to carve the filling into shape."

For those who are a little slow in handling amalgam alloys, and are in the habit of using this material for building up a large part of the crowns of some teeth with a cement lining, Dr. Ward recommends such alloys as Rutherford's No. 17, 3 and 1, or the Standard Alloy of Eckfeldt and Dubois. These all give pleasing color effects. What is the best amalgam alloy to use for the average filling and under average conditions? In answer to this Dr. Ward says the greatest possibilities lie in the use of the fully annealed high percentage silver alloys. There are some practitioners who seem not to work fast enough to be able to do good work with them, but these men constitute a small part of the profession, and usually when I have investigated these men's objections to this class of alloy, I have found that they were using medium and rapid setting grades of these products. With a high percentage silver alloy, such as Twentieth Century, True Dentalloy, Royal, Fellowship, Triumph, Micrometric, Rutherford's No. 17, and several others, marked slow setting, and work fast and thoroughly, with the excess of mercury well removed, the two principal objections to these alloys, viz.: too rapid setting and large expansion will be largely removed. This is the opinion of a great majority of the best operators of this country." There seems to be widely different views among dentists regarding the suitability of amalgam-alloys as a filling material. Dr. Ward does not consider it a material equal to a gold inlay for restorative purposes. He says: "I am forced to the conclusion that it occupies a place inferior to the gold inlay, though far preferable in many cases, even in the most exclusive practices, to the common forms of crowns." As opposed to this view, Dr. George S. Hershey, in *Dental Summary* (Aug.) dealing with the question of the eradication of pyorrhea asks: "Has any one ever seen a clean, healthy mouth in which the teeth, to any extent, have been filled with amalgam, after four years from date of filling? and I mean by this to include fillings which extend to and under the free margin of the gum. It seems impossible to insert an amalgam filling that will not pull away from the margins of the cavity. The hypersensitiveness of teeth caused by amalgam fillings in so many cases, is no doubt the primary cause of nervous stomach and nervous diseases peculiar to certain individuals. That the elimination of the amalgam filling is considered very important by the most prominent stomach specialists is evidenced by the fact that they will not take a case where this condition exists."

Apparently the last word has not been said on this subject.

The Care of Children's Teeth

THE MOST NEGLECTED FEATURE OF PEDIATRIC MEDICINE.

THOMAS C. MCCLEAVE, M.D., OAKLAND, CALIF.

[It is very significant of an awakened medical profession that the chairman of the section on Diseases of Children, at the recent Detroit meeting of the American Medical Association, should have chosen the subject of "Children's Teeth" for the chairman's address. The fact is doubly significant when we observe that Dr. McCleave refers to the care of children's teeth as the most important feature of pediatric medicine. ORAL HEALTH is indebted to the Journal of the A. M. A. for this material.—EDITOR]

MODERN medicine concerns itself very largely with the prevention of disease and deformity, and nowhere is there wider or more effective application of the principles of preventive practice than in childhood. Only in this period of life can developmental defects be successfully dealt with, and during this time occurs the greatest incidence of those diseases and infectious conditions which so largely determine the disabilities and deformities of later life.

Tuberculosis, it is now generally recognized, is essentially, at least in its inception, a disease of early life. Measles, scarlet fever, diphtheria and poliomyelitis, and adenoid, tonsil and dental infections, to which may be ascribed so many of the cardiovascular, renal, articular, nervous and other disorders of later years, all occur chiefly in childhood, and methods of control, if they are to avail anything, must be applied then.

Preventive medicine, then, it may fairly be said, is of prime importance to the pediatrician. Prophylactic measures not instituted in childhood are, in the majority of cases, too late.

In many respects the problems of preventive medicine in childhood are well formulated and intelligently appreciated, though in most localities the machinery to cope with them is still inadequate.

The problem of the care of the teeth, however, remains very generally neglected. Several of our larger cities have splendid systems of dental clinics, and more or less dental inspection is carried on in the schools of even many of the smaller communities; but in most places nothing is being done. Indifference to the subject pervades both the medical and dental professions. Many members of the latter, indeed, seem woefully ignorant of the importance of the conservation of children's teeth, and so commonly do dentists refuse to

accept children as patients that there is often great difficulty in having necessary work done. It has been my frequent experience, in trying to save the deciduous premolars or even the first permanent molar, to have dentists decline to undertake the work on the ground that it was not worth while. Doubtless most children are difficult and trying dental patients, and perhaps few dentists possess the tact, patience, sympathy and insight into child nature essential to him who would successfully deal with them; but I believe that ignorance is the chief obstacle. "The deciduous teeth are only intended to last a few years anyway and then be replaced, and what matters it if through early decay they are prematurely lost? Fillings to preserve them would fall out in a short time and have to be done over, so why bother with them? The permanent teeth will be crooked, of course, but then, they might be so anyway, and they can be straightened later if desired." Thus the voice of ignorance, and it doubtless salves many a conscience that should feel guilty.

For the purpose of our discussion we may consider the teeth in relation to developmental, nutritional and infectious disorders associated with them.

The most important developmental defects involve the bones of the jaws and face primarily, and are manifested by disturbances of dental structure, alinement and occlusal relations commonly leading to more or less interference with the functions of mastication, respiration and speech, and alterations in the esthetic appearance of the dental arches and facial expression. This syndrome is included, by the dental profession, in the term "malocclusion." The causes of malocclusion may originate in fetal life, dating back to the period of the differentiation of the dental lamina and tooth germs, or even beyond, and the bony deformities may, in some cases, be recognized before the eruption of the teeth and may vary from complete absence of certain bones, and defects such as cleft palate, to merely insignificant changes in relationships.

In other instances, a normal deciduous dentition may be ruined by neglect or misuse. Neglect of oral hygiene leads to early caries and loss of teeth, with consequent shrinkage and abnormalities of growth of the jaws, which force the oncoming permanent teeth out of their natural positions. Similar effects may follow misuse, which implies the failure to utilize the masticatory function of the teeth, and may be caused by an improper dietary, or by bad habits, such as bolting the food, or chewing on one side, or with the front teeth only, which may cause relatively disproportionate growth of different parts of the jaws; or caries or other painful conditions of the mouth and teeth may prevent proper mastication. Nasal deformities, adenoids and hypertrophied tonsils may induce changes in the normal palatal arch and dental alinement; and certain systemic disorders, as syphilis, rickets and malnutrition may profoundly affect the development of

the jaws and teeth, as may also disorders of the endocrine organs, as dyspituitarism.

A correlation between dental malformations and certain other developmental defects has also been commonly observed. Deformities of the palate and dental arches are almost invariably found in the mentally defective, while cretins quite constantly exhibit irregularities and abnormalities in the position, structure, eruption and shedding of the teeth. The deciduous teeth, for instance, may be retained to adult life, co-existing with the permanent teeth.

The development relationships between the jaws and other bones of the face are strikingly shown by the marvellous development of this region which occurs in the first two years of life, more marked than in any other part of the body. It is a favorite saying that "Beauty is skin deep"; but how false this is. Beauty, as applied to human beings, ordinarily refers to the aspect of the face, and here beauty is "bone deep." No matter how fine the complexion or texture of the skin, there is no beauty in overshot jaws, receding chins and crooked teeth, or in the vacuous expression of the habitual mouth breather. As we give so much thought to our personal appearance, and as we are so much judged by our appearance, and the impressions we create are to such an extent dependent on it, how important it is, then, that parents should very early be properly advised as to the care of their children's mouths, in relation to the development of their faces.

That malocclusion of the teeth may seriously interfere with one's esthetic appearance and with mastication, and even with speech, is evident even to the laity.

Respiratory disturbances result chiefly from encroachment of the narrowed high-arched palatal structures on the nasal cavity. The nasal passages are contracted, bowing of the septum still further reduces the air-space, and adenoïd and tonsillar hypertrophy are usually associated. There occur then the manifestations of mental and physical impairment related to obstruction of nasal breathing, which, because of their notoriety, need not be discussed in detail here.

Nutritional disturbances associated with abnormal buccal conditions are common. The mouth is one of the important organs of digestion. Mastication of the food is an essential prelude to the processes which are to follow, and in respect to starchy foods, a considerable proportion of the digestive process should normally occur in the mouth. That a diseased organ cannot functionate normally is axiomatic. Moreover, digestive processes not properly instituted cannot be completed without entailing on other organs demands beyond their normal capacity. Thus children with bad teeth have commonly disturbances of other digestive organs, and impaired nutrition, which is of course accentuated by the associated toxemia due to absorption of bacterial products from the mouth. The swal-

lowing of these, also, no doubt, plays a part in the derangement of gastric and intestinal digestion.

A proper selection of the dietary in young children is of much significance in the development of sound and normal teeth; but another member of the section is to discuss this phase of the subject, and I will not trespass on his topic.

Infections of the teeth and alveolar processes afford two of the commonest diseases to which man is subject, dental caries and pyorrhea. Interest in caries dates back to early times and it has been ascribed to a great variety of etiologic factors. In Hippocrates' time, disturbance of the humors of the body was assigned as a cause. In the middle ages, the worm theory prevailed. At one time, each tooth was supposed to act as the pole in a galvanic battery and electrical action was thought to account for the dissolution of the tooth. Later on, caries was supposed to be due to the presence in the mouth of abnormal chemical bodies, white decay being attributed to nitric acid, yellow decay to hydrochloric acid, and brown decay to sulphuric acid. With a knowledge of bacteriology came the septic theory, and then the chemicobacterial theory, which is now generally accepted. This theory assumes that certain of the mouth organisms, by the production of enzymes, induce fermentative processes in the carbohydrate food materials in the mouth, with resultant formation of acids, chiefly lactic, which cause dissolution of the inorganic substances in the teeth. Destruction of the harder portions of the tooth structure exposes the pulp to infection, in which may be also involved the peridental soft tissues or even the bone. Some authors have claimed that caries is endogenous rather than exogenous in origin, but this hypothesis finds little support.

Conditions constantly present in the mouth, free exposure to bacteria, and warmth and moisture to facilitate their growth, predispose to germ activity in this region, and liability to caries is enhanced, according to the theory, in the presence of lactic acid forming organisms, by undue retention of carbohydrate materials in proximity to the teeth. This may be due to the form or arrangement of the teeth, pits or crevices in the enamel, recession of the gums, or faulty positions of the teeth in relation to each other or to soft parts, tending to increase the liability to retention of food particles. An arrested or insufficient flow of saliva may also be a factor, but this is rare except during fevers. If prolonged, caries may be greatly aggravated by it. The most important factors, however, are probably the food itself and the dietetic habits of the individual. This cannot be gone into in detail, but in general it may be said that soft foods that require little mastication, which assists in the mechanical cleansing of the teeth, or sweet sticky syrupy foods that so often constitute the last part of a meal, seem to predispose to caries. That mushes, custards, puddings,

soft breadstuffs, bread and milk, potatoes, sweets, etc., form a large part of children's diets, is well known.

Dry, fibrous and acid foods, such as dry cereals, fresh vegetables and fruits, on the other hand, seem antagonistic to the development of caries. They are especially valuable, then, particularly if eaten at the close of a meal.

Dietetic habits, such as eating before retiring, or the eating of sweets at bedtime or between meals, or too frequent eating, which leaves a fresh and constantly replenished supply of carbohydrate material in the mouth, or bolting of food, may favor retention of carbohydrates and so predispose to caries.

The relative alkalinity and acidity of the saliva in relation to caries is at present a subject of great interest in the dental profession, largely induced by Pickerill's work, in which he seemed to prove that by varying the stimuli applied to the salivary glands by foods or chemicals taken in the mouth, changes may be brought about in the reaction of the saliva, it being his theory that caries is dependent on acidity of the saliva. Critical review of his methods by other investigators, however, is said to have disclosed certain fallacies, and it would now appear that a tendency to caries depends perhaps not so much on the mere acidity or alkalinity of the saliva, as such, but rather on the difference in reaction between the so-called resting saliva and the saliva activated by the taking of food or chewing. This difference is called the salivary factor.

It is well known that the reaction of a culture medium may ordinarily be altered but little without affecting the growth of organisms in it, slight changes perhaps inhibiting entirely the growth of certain bacteria. It would seem, according to observations on which this theory is founded, that wide variations in the reaction of the resting as compared to the activated saliva favors immunity to caries, by producing conditions unsuitable for the excessive proliferation of acid-forming organisms in the mouth. The influence of foods and chemicals on the process is still unsettled.

Pyorrhea, also, has of late attained a great prominence in medical literature because of the investigations into the causative relationship of the *Endamoeba gingivalis* to this condition, which have aroused considerable interest and some controversy.

We are chiefly concerned, however, with the more general aspects of these very common infectious diseases.

Almost invariably associated with suppurative conditions in the mouth we find infections of the tonsils and other pharyngeal and nasal structures. Sinus disease, middle ear inflammations, inflammatory eye disturbances from direct extension of infection, and toxic changes in the iris, choroid, retina or optic nerve have been frequently reported.

Tubercle bacilla have been isolated from the cavities of carious

teeth unassociated with apparent tuberculous disease in the individual other than cervical lymphadenitis; but dental caries so profoundly affects the subject's general nutrition as to constitute a grave predisposing factor in tuberculosis, whether or not we regard the teeth as possible direct portals of infection with the bacillus. Simple and suppurative lymphadenitis resulting from caries is a common phenomenon.

During the last several years, the subject of focal infections has occupied perhaps the foremost place in medical thought. It is unnecessary here to rehearse the many conditions included in the category of infections of buccal origin, because they are familiar to all by reason of the vast literature on focal infection. If it is true, as Billings has said, that, barring skin and venereal disorders, the largest percentage of human diseases have their origin in the mouth and naso-pharyngeal area; or if all nontraumatic joint inflammations are evidence of infection elsewhere, most commonly in this same region, it would seem that the importance of my subject can hardly be exaggerated.

What is to be done about it? The problem is appalling by reason of the vastness of the personnel involved and the time required for adequate dental treatment. Every dental patient demands hours of actual work, and by whom and when and where is this to be done? Wise men, leaders of the dental profession all over the country, see the need and are striving to devise means of relief. The medical profession, largely through the impetus of "focal infection" propaganda, realizes a new significance in decaying teeth and septic mouths. The public is being aroused to the importance of oral hygiene. Philanthropy is interested. The age incidence of many dental defects makes the problem of peculiar concern to the pediatrician. I have therefore ventured to bring the subject to your attention to-day in the hope of stimulating your further interest in it, and enlisting your aid in helping to promote its consideration in your several communities.

Co-operation between the dental and medical professions must be fostered. Both they and the public must be educated to the need by those who already realize it. The rank and file of the dentists must learn that they are not merely artisans and mechanics, but that they are workers in one of the great fields of medicine, in which they have to do with matters which may determine the whole future health and usefulness of the individual; and that children, instead of being avoided, are to be regarded as their most important patients, because much of their work can be effective only in children.

Parents must be made to appreciate the tremendous importance of conserving the deciduous teeth and of correcting orthodontic defects and deformities early; and those who are able to pay must be taught that the work is worth paying for, that it may be attractive to high-class scientific men and women.

Time does not permit a discussion of details of organization of the forces concerned in the problem. I want to say, however, that a children's clinic which lacks a dental department as an inherent part of its organization is defective.

Meeting of the Executive

ORAL HYGIENE COMMITTEE OF THE O.D.S.

THE Executive Committee of the Oral Hygiene Committee of the Ontario Dental Society held its 55th meeting on Thursday, October 8th, 1916, at the Crescent Inn, Toronto, at 6:15 p. m.

Members present were Drs. Reade, Eaton, McLaughlin, Trotter, Ellis, Bennett, and Coyne.

The minutes of the last meeting were read and confirmed. The principal business of the evening was the arrangements for the Annual Conference of the Oral Hygiene Committee in November next and providing Oral Hygiene lecturers for some of the School Teachers' Conventions during the coming Autumn.

Dr. McLaughlin moved, seconded by Dr. Trotter, that Dr. Secombe be asked to go to St. Thomas and address the Teachers' Convention on Oral Hygiene. Carried.

The Secretary read correspondence from Dr. Snell, of Essex, Dr. Sparks, of Kingston, Dr. Cavanagh, of Cornwall, and Dr. Bennett, of St. Thomas, regarding addresses on Oral Hygiene at the various Teachers' Conventions.

Dr. Snell was appointed to address the Essex Convention and the Secretary was instructed to send Dr. Snell lantern slides.

Dr. Morrison had arranged for addressing the Peterboro Convention.

It was decided to hold the annual conference of the Ontario Oral Hygiene Convention in Toronto on November 21st (the day before the exhibit of the Ontario Horticultural Society), and to procure Inspector Taylor, of St. Thomas, to address the evening meeting.

Dr. Eaton, Dr. McLaughlin and Dr. Secombe, were appointed a committee to secure some men outside Toronto to discuss Inspector Taylor's paper.

It was decided that Dr. Trotter be appointed to arrange for the luncheon and speaker, and Dr. Bothwell to arrange for the dinner.

The itinerary for the day was left in the hands of Drs. Reade, Secombe, Ellis and Coyne.

The following accounts were ordered paid:

R. S. Weir, letter heads and envelopes, \$24.50; type-paper, \$1.25.

Meeting adjourned at 8.45 p. m.

N. S. COYNE,

Secretary Oral Hygiene Committee.

Announcement—Toronto Dental Society— Season 1916-17

THE Executive of the Toronto Dental Society announces a program for the coming season, which it believes will meet with the approval of the members. It has been the aim of the Executive to secure leading men in the profession who are quite capable of discussing some of the subjects which are most perplexing to the conscientious dentist desirous of rendering his best service to his patients.

Have you been worrying about the relation of the mouth to General Streptococcus Infections? If so, come to the initial meeting to be held Thursday evening, Nov. 9th, at the Carls-Rite Hotel. Dr. F. B. Moorehead, Chicago, Dean of the College of Dentistry of the University of Illinois, will address the meeting on this subject. It will interest you.

Dr. R. Ottolengui, of New York, who needs no introduction to the Toronto Dental Society, will be with us on Monday evening, Dec. 4th. His topic will be the old yet ever-troublesome subject of root canals, their treatment and filling. This will be illustrated by numerous lantern slides.

The dates for the remaining meetings have not yet been definitely arranged, but Dr. James P. Ruyl, of New York, whose prosthetic work attracted special attention at the National Dental meeting at Louisville last July, has promised to present an essay at our January meeting on "The Surgical Treatment of Abnormal Edentulous Mouths before Inserting Dentures in Order to Restore Natural Expression."

In February, Dr. J. Leon Williams, New York, of Trubyte fame, has assured us that he has something new for us in the "Evolution of Human Teeth," with special reference to their masticating surfaces. For those who are endeavoring to make their restorations as nearly normal as possible, this subject should prove both interesting and educative.

The meetings will be held, as previously, at the Carls-Rite Hotel. Although the Hotel Management has improved the standard of its service considerably, thus necessitating increased prices, the Executive have been able to secure the improved service for its members at rates still within our means. Dinner will be served at six-thirty.

There will be no special rates for Toronto dentists who wish to attend other than the full number of meetings.

Tickets will be mailed in the course of a few days to all members in good standing last year.

E. F. ARNOLD,
President.

R. D. THORNTON,
Secretary.

New Militia Order Covering C.A.D.C.

THE following militia order was recently issued by the Militia Department from Headquarters, Ottawa:

Order No. 287:

CANADIAN ARMY DENTAL CORPS ESTABLISHMENT FOR HOME SERVICE—CANADIAN EXPEDITIONARY FORCE.

The following establishment for the Canadian Army Dental Corps, Canadian Expeditionary Force, for service in Canada is authorized:

MILITIA HEADQUARTERS.

- 1 Director Dental Services, with rank of Lieutenant-Colonel.
- 1 Assistant.
- 1 Quartermaster.
- 1 Clerk.
- 1 Stenographer.
- 1 Quartermaster Sergeant.
- 1 Sergeant Mechanical Dentist.
- 1 Batman.

MILITARY DISTRICTS.

- 1 Assistant Director Dental Services for each Military District, and available for Camps of Instruction with rank of Major.
- 1 Quartermaster.
- 1 Quartermaster Sergeant.
- 1 Clerk.
- 1 Batman.

BATTALION ESTABLISHMENT.

Add to the establishment of each Battalion C. E. F.:

- 1 Dental Surgeon.
- 1 N. C. O. Assistant.
- 1 Batman.

Officers appointed to Home Battalions to have the rank of Captain if they have practised their profession more than two years; if under two years, the rank of Lieutenant.

OTHER UNITS.

- 1 Dental Surgeon per Artillery Brigade.
 - 1 " " Field Ambulance.
 - 1 " " Stationary Hospital.
 - 1 " " General Hospital.
- Each with one N. C. O. and batman.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

Honor Roll

MAJOR P. P. BALLACHEY, 58th Batt.
MAJOR C. E. SALE, 18th Batt., 4th Brigade.
LIEUT. H. J. MacLAURIN, 43rd Batt.
PTE. H. GREENWOOD, 76th Batt.

CANADIAN ARMY DENTAL CORPS

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†Lt.-Col. W. B. Clayton.	Capt. E. B. Sparkes.	Lieut. R. Jamieson.
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*Acting Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—Care Director Dental Services, Canadian Contingents, 23 Earls Ave., Folkestone, England.

of CANADIAN DENTISTS

ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

Concentration Camps.—(Continued.)

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Lieut. W. H. McLaren	Lieut. A. V. Sinclair	Lieut. J. H. Zinn
Lieut. L. D. McLaurin	Lieut. H. L. Smith	Sgt. E. G. Berry
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Lieut. J. G. O'Neil	Lieut. E. L. Thompson	Sgt. W. J. Taylor
Lieut. F. H. Quinn	Lieut. Tucker	

Divisional Officers

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Major T. C. Bruce	Major F. P. Shaw	Major J. M. Wilson
Major A. Dubord	Major Geo. K. Thomson	Major W. W. Wright

ATTACHED TO CORPS OTHER THAN C.A.D.C.

Overseas

Major G. S. Cameron, 9th C.M.R.	Capt. J. L. McLean, 59th Batt.
Major F. T. Coghlan, 25th Battery.	Capt. Walter McNally, 179th Batt.
Major Chas. A. Corrigan, Army Service Corps.	Capt. S. J. Redpath, 47th Batt.
Capt. K. C. Campbell, 43rd Batt.	Lieut. A. R. Legge, 58th Batt.
Capt. J. R. Duff, 79th Batt.	Lieut. L. P. McNally, 50th Batt.
Capt. J. Harper, Royal Navy.	Lieut. L. L. Matchett, C.F.A.
	Staff Sgt. J. G. Roberts, C.A.M.C.

Concentration Camps

Lieut. Col. E. F. Armstrong, 159th Batt.	Major Archie L. Johnson, 12th Batt.
Lieut.-Col. Neil Smith, 181st Batt.	Lieut. A. J. Kennedy, 114th Batt.
Major H. A. Croll, 10th C.M.R.	Lieut. C. Nicholson, 129th Batt.
Major N. Schnarr, 94th Batt.	Lieut. T. H. Renton, 146th Batt.

UNDERGRADUATES

Overseas

Capt. R. M. Barbour, 64th Batt.	A. W. Jones, C.A.D.C.	Wm. Mackay, C.A.D.C.
W. G. Alston, C.A.D.C.	J. V. Lally, C.A.D.C.	C. T. Meale, C.A.D.C.
F. H. Barry, C.A.D.C.	J. G. Larmour, C.F.A.	G. S. Murray, C.A.D.C.
A. Chambers, C.A.D.C.	H. B. Legate, C.A.D.C.	W. E. Sherrin, 67th Battery
E. R. Dixon, 71st Batt.	W. C. Leggett, C.A.D.C.	T. H. Walker, C.F.A.
E. Garfat, 71st Batt.	E. S. McBride, C.A.D.C.	A. Wallon, C.A.M.C.
J. E. Irwin, C.A.D.C.	R. B. McGuire (British Corps).	B. Watson, C.A.M.C.
J. T. Irwin, 4th U. of T. Co		

Concentration Camps

H. R. Anderson, 67th Battery.	A. N. Laddlaw, Mach. Gun
Sergt. J. C. Barker	E. C. McKee, C.A.D.C.
H. G. Bean, 198th Batt.	J. M. McLeod, Div. Sig. Corps
R. Bishop, C.A.D.C.	E. C. McKee, C.A.D.C.
R. T. Broadworth, 67th Battery.	A. L. Norton, C.A.D.C.
A. G. Calbeck, 67th Battery.	C. T. Parker, C.A.D.C.
A. E. Chegwin, 198th Batt.	A. R. Pong, C.A.D.C.
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G. E. Harper, C.F.B.	G. A. Sney, Army Transport
G. M. Helsz, Div. Sig. Corps.	G. H. Sloan, 20th Batt.
A. S. Holmes, Div. Sig. Corps.	W. H. Smith, 160th Batt.
G. W. Howson, 126th Batt.	W. L. Smith, Div. Sig. Corps.
T. H. Hutchinson, C.A.D.C.	V. D. Snow, 67th Battery
R. Hyde	C. W. Steele, 67th Battery
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TORONTO, NOVEMBER, 1916

No. 11

EDITORIAL

Two Chamber Dental Sterilizers

FROM the time of Hunter's introduction of the words "Oral Sepsis" in 1911 until the present time, there has been a steady upward climb toward more conservative and more aseptic methods in the practice of Dentistry. The dominant note in Dental Surgery is no longer "Save the tooth at any cost." The guiding principle now is "Health at any cost, even though it occasion the loss of the tooth."

The application of asepsis to methods of dental treatment, and particularly to root canal operations, requires greater attention to the question of sterilization. The average dental sterilizer, with but one chamber, for wet sterilization, is entirely inadequate. A second chamber, where cotton, linen wipes, etc., may be sterilized and dried, is an absolute necessity if surgically clean root canal operations are to be performed. Two-chamber sterilizers may be easily obtained, and are just as inexpensive as the single-chamber type. The dry chamber may be used for root filling materials as well as dressings and cotton. Cotton may be wound upon a series of broaches and placed in the sterilizer dry chamber. These are immediately available to the operator as required.

One hundred of such sterilizers were recently ordered by the Royal College of Dental Surgeons for use in the college infirmary. In addition, each student is to use a modified form of surgeons' gown for operating, and each patient a loose linen cap or hood for head covering.

Current Dental literature contains many articles upon the question of local dental infection and the importance of root canal sterilization and treatment. We must, however, avoid the error of studying these questions as academic problems, failing entirely in their practical application to our everyday work. How can we hope to attain the best results in root canal work without the sterilization of cotton? The operator may use a simple device, known as a cotton-winder, for placing the cotton upon the broach, instead of using his fingers, but this in no way obviates the absolute necessity for cotton sterilization.

Editorial Notes

R.C.D.S. MATRICULATION.

AT a recent meeting of the Board of Directors of the Royal College of Dental Surgeons of Ontario, it was decided that commencing with the session of 1918-19, no student would be admitted to the School of Dentistry without complete R. C. D. S. matriculation.

Heretofore students have been admitted to the Freshmen class of the college, with partial matriculation standing, and were required to complete matriculation before entering the Sophomore class.

The effect of this ruling, therefore, is to admit partial matriculants (having completed eight papers) to the Freshmen class next session (1917-18), but not subsequent to that date.

Complete R. C. D. S. matriculation is ten matriculation papers.—Normal Entrance with Latin or its equivalent.

TO ENCOURAGE STUDENT READING.

A COMMENDABLE move has been made at the Royal College of Dental Surgeons in the conduct of the library. There has been placed in the students' reading room, a book case which is to contain copies of the more recent works on Dentistry and the Allied Sciences. These books are to be freely available to the students at the college, without the formality of checking the books out upon a card as heretofore. The only stipulation being that the books must not be taken away from the reading room.

It has been frequently charged that the members of the dental profession do not read as extensively as they should, and if this be true, the time to correct these conditions, is during the students' college

course. Every effort on the part of Dental Colleges to encourage reading by the dental student is to be greatly desired.

CAPTAIN ORVILLE A. ELLIOTT, C.A.D.C., of Toronto, and attached to the 5th Field Ambulance C.E.F., France, was recently reported wounded in the leg below the hip. Captain Elliott was hit by a piece of high explosive shell, while working in a German dug-out that had been recently taken, and which was being used as a clearing station for the Field Ambulance. We are very glad to be able to report that Captain Elliott's wound is not serious.

ILLNESS OF DR. W. E. WILLMOTT.

THE profession will regret to learn that Dr. W. E. Willmott is confined to the hospital with an attack of Typhoid Fever. Reports, however, have been quite favorable, and it is to be sincerely hoped that Dr. Willmott will continue to progress and be soon able to take up his duties again.

NINETY-SIX FRESHMAN AT R.C.D.S.

THERE have registered at the Royal College of Dental Surgeons for the regular session of 1916-17 a total of 96 freshmen. A year ago the freshmen class numbered 106. In view of the need in Canada for dentists, both in the militia and in civil practice, the R. C. D. S. is to be congratulated upon the maintenance of its class standard of 100 students, under the unusual conditions created by the war.



FRESHMAN CLASS, SESSION 1916-17
ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO

Dentistry and Life Insurance

LIFE Insurance Companies are now recognizing that a complete physical examination includes a detailed examination of the Oral Cavity. A clean, healthy mouth and the absence of dental foci of infection, predisposes the average individual to a longer life than is otherwise possible.





ERNEST F. ARNOLD, D.D.S.
President Toronto Dental Society

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 6

TORONTO, DECEMBER, 1916

No. 12

The Relation of the Mouth to General Streptococcus Infection

F. B. MOOREHEAD, DEAN, UNIVERSITY OF ILLINOIS, COLLEGE OF DENTISTRY.

[Upon the evening of November 9th, 1916, Dr. F. B. Moorehead, of Chicago, delivered, before the Toronto Dental Society, the opening address of the season. The stenographic report of the address appears herewith. Dr. Moorehead spoke quite informally and repeatedly urged upon the members the necessarily incomplete presentation of the subject, under the circumstances. The speaker stated that he was discussing very briefly a few "salient hilltops." At the conclusion of the address, it was conceded that the members had been guided by Dr. Moorehead to "mountain-peaks," where a much clearer view was obtained of the whole question of focal infection.

Members of the profession will be glad to learn that Dr. Moorehead contemplates the preparation of a monograph upon this subject and it is to be hoped that it will be published and available to the profession sometime during the present winter. The matter will then be treated more in detail, by the author, and doubtless a great deal of scientific matter in connection with the whole question will be presented.—Editor.]

MR. President and Members of the Toronto Dental Society. It is to me no small honor to come from my parish to this parish as a minister of righteousness. I remember when that primal American, Theodore Roosevelt, was President of the United States he was visited by a Board of Bishops of one of the denominations. They came into his presence and introduced themselves as Ministers of Righteousness, and after they had made their presentation speech

Theodore Roosevelt said, I want you gentlemen to know that I am no less a Minister of Righteousness than you. Now I think the right kind of dentist is a minister of righteousness, and the right kind of righteousness. I am indeed very happy to come from Chicago to Toronto in response to your invitation to speak to you for a few minutes on a topic which is of vital importance to every man in this room. I have no new message at all; there is no legerdemain in this theme; there is nothing mystical about it; it is a discussion of the things you and I meet in our part of the practice of general medicine. I never can divorce in my own mind dentistry from medicine, and I never shall. (Hear, hear). Whoever made that unfortunate mistake that was made away back in the dark ages when somebody created a separate college of learning for dentists, that somebody made, in my opinion, a fatal mistake. The man who treats the mouth ought not to be any different in his training (unless more thorough perhaps), than the man who treats any other part of the body, as a specialist. He ought to have the same perspective; he ought to have the same fundamental grasp of things, and he ought to sustain the same relation to the world of medicine that the other specialists do. We are unfortunate in our birthright, but since we are born with the deformity we shall have to make the most of it.

Now this question of focal infections is not new. If you have the time and inclination to go back into old medical literature you will find many, many years ago specific allusions made, and sometimes definite indictments of the thing I am going to talk to you about for a few minutes to-night. So that it is not a new theme, it is not a new idea, it is not a new scientific fact, but it is the re-shaping or perhaps the re-emphasising of a theme that has been more or less prominent for a good many years.

Now there may be introduced into the human body through one or another type of tissue an organism of this so-called streptococcus group, and through the circulating fluids of the body this organism may be carried to one tissue or another, localized, and produce a lesion. As I say, there is nothing at all new in that and there is nothing mysterious about it. Viewed sensibly it is just a plain matter of fact and a sensible sort of proposition. Now where does this group of organisms get into the body? Unfortunately a group of men have been inclined, because of Sir William Hunter's indictment some years since, to look upon the mouth as the harbinger of all evil and make the claim that the mouth is responsible for most of the chronic infections of the human body. Now, that is not so. Viewed as a unit it is perhaps more responsible than any other unit in the body, but we must not lose sight of the principle involved, as well as the fact. These organisms get into the body through well defined localities. First of all the pelvis, the uterus (in the female) pus tubes, and so forth; in the male the prostate, the appendix, the gall

bladder, the tonsils, the nose, the exterior sinuses, and the jaw and its tissues. Those are the common places where chronic infection has its inception, although they are not the only places. Accidentally, by trachoma and other ways, infection may get in, — through an ingrowing toe nail perhaps that is infected, or through any abrasion in the mucosa of the body; but in surveying the body the place we look for these chronic infections is the pelvis, the appendix, the gall bladder, the tonsil, the nose, the jaw and its tissues.

I want to discuss with you very briefly a few salient hill-tops, a few points of importance. I want to apologize in the first place for presuming to talk to you on a composite subject. I am trying in a few minutes to survey a vast territory and you will appreciate that, and understand why I am doing it, by the time I have finished. For that reason I shall have to confine myself to just a few significant things which I shall ask you to carry in your minds as we go along. First, the complexity of tissue in the jaw makes infection an exceedingly easy matter. There is no place in the body where you find the same construction of tissue as you do in the jaw, and when you stop to think of the elements, the histological and anatomical arrangement in the jaw, it is easy to see how infection can occur, — the function of the jaw, the exposure of the jaw, the location of it, all make for easy infection and difficulty of treatment. Just in proportion as it is easy and simple for infection in the mouth to occur, just in inverse ratio is it difficult to manage these infections. There is no place in the body where it is so difficult to preserve the tissue and preserve the physiological function of the body as in handling these tissues of the mouth. That is an exceedingly important thing to remember in practice. I think that we are dealing with a field where infection can easily occur and where it is more or less difficult to remove that infection, and at the same time preserve the function of the part.

Next comes the question of transmutation. Now that is a mooted subject. When Dr. Rosenow first discussed and put in print this matter of transmutation, biologists far and wide took radical exception, arguing that it was biologically impossible for transmutation to occur. And yet strange as that may seem and logical as these men all are in their contentions, a great many of our greatest biologists and bacteriologists on visiting Dr. Rosenow's laboratory and seeing his work were, at all events, if not convinced, strongly of the opinion that there is after all something in this theory of transmutation. Dr. Rosenow began his work as an intern in the Presbyterian Hospital of Chicago in Dr. Frank Billings' service, and he has the habit of assigning his interns some problem to solve, and every intern must do their problem. The problem assigned to Dr. Rosenow was streptococcus, and Dr. Billings assigned Dr. Rosenow to work on pneumococcus. He discovered in working on pneumococcus (and he

has the initial culture to-day of that pneumococcus), that it changed into a streptococcus, passing through various forms and developing in the history of this organism from pneumococcus to streptococcus and the various types of the streptococcus and back again. Now, as I say, a great many scientists take exception to the possibility of such a thing. Be that as it may, there is undoubtedly something in the fact that these organisms do something more than change their virulence in this streptococcus group. Whether a streptococcus is a modified pneumococcus or a pneumococcus a modified streptococcus I don't know. I do not claim to be a biologist or a bacteriologist, but the evidence that Dr. Rosenow has produced is of sufficient importance, and sufficiently well done, to at least warrant every man giving it serious thought. Clinically there seems to be some evidence to prove this question of transmutation. Looking at the fact of vaccine therapy for just a moment. Any man who has had any clinical experience, any man who has done any amount of work in which he has employed autogenous vaccines, who has made vaccines and employed them, has found in certain cases almost signal results, and then in another large group of cases perhaps untoward results or negative results. Now, if there is any truth at all in this question of transmutation it explains why, in one instance we get an antagonism or an anti-body, and in another case, negative results. If, for instance, a given strain of streptococcus gets into a focal tonsil, (gets into certain vessels of the body and localizes in the joints, causing neuritis, locating in the muscles and causing myelitis, localizes in the different tissues and establishing an infection), if, when the culture is made from the initial focus, the organism is of the same strain and nature as the organism working in the tissues involved, you would get necessarily an antagonism; but if this organism is of a changed character and the organism that is operating in the remote parts of the body is altogether different from the initial focus, then obviously you would not get an antagonism or anti-body in your toxin at all. One would be constrained to believe, after some experience in vaccine therapy that probably after all there is something in this question of transmutation, or if not, something analagous to transmutation.

Another very important thing for one to bear in mind in dealing with this whole subject of chronic infection is the question of localization. There isn't any question at all, and it is easily demonstrable, that these organisms have special affinities and the organism which gains entrance into your mouth, your tonsil, your appendix, may have a predilection for heart tissue and may get on your heart valves and there produce vegetations causing malignant and ulcerative endocarditis, which is always fatal, or an affinity for the muscles, or an affinity for the joints, or an affinity for the nerves. One of the most striking things that comes to a man who is doing much of this

experimental work with the strepto-pneumococcus group is that it has a definite elective capacity for certain groups of tissues under certain conditions. That you can take the germ from a human being's joint, or from his appendix, or from a piece of his muscle wherever situated, cultivate it, get your organism, and then inject that organism into animals, guinea pigs, rabbits and so forth, and you will get with almost mathematical precision those animals developing lesions in groups of tissues, isolated joints, and of course scattering the infection every place in the body, in the muscles, in the nerves, and so forth. Now, that is of tremendous importance, because when one finds a focus of infection in the body he must remember in that focus there is the possibility of a serious lesion, something perhaps more than an ordinary arthritis or an ordinary myelitis. That organism we are dealing with and the focus you have under consideration, may be an organism which may have an affinity for heart tissue, resulting in an ulcerative or malignant endocarditis.

Now, roughly speaking, there are two types of infection in which you come in contact in your practice, so-called pyorrhea or chronic suppurative pericementitis, and chronic abscesses. Those are the two chronic types of infection which are met with in the mouth in general practice. Dentistry has a very specific relation to both these forms. There are certain men in the dental profession, who are attending the universities where stress is laid upon dental preparation and academic training, who are emphasizing the so-called scientific subjects to the exclusion of the mechanical subjects. If they are ever out my way, they would find there was a long, loud call for better mechanical dentists. This very fact of focal infections makes that a long, loud call. There never was a single item in dentistry which so emphasized the necessity for a better type of mechanical dentistry than this does. Now I say the mechanical dentist bears a relationship to both these forms of infection. First pyorrhea, as Dr. Black has shown, I think conclusively, has its genesis for the most part in gingivitis, that in all forms of pyorrhea the first form is a gingival inflammation. The gingivitis has its cause in what? Any type of irritation. That may be deposits upon the surface of the teeth in the form of calculi, it may be a mechanical irritation in any form due to mechanical dentistry. You know what those forms are. You have seen them coming from the practices of other men. Of course you have never seen them in your own offices. (Laughter). But you know what they are, ill-fitting crowns (crowns that are made big enough to fit over the natural crown of the tooth with all the enamel left on and then put down until it impinges the soft tissues), ill-fitting bridges causing irritation, ill-fitting plates and dentures of all kinds, partial and complete, margins of fillings that are not polished smooth. All those forms of mechanical irritation are responsible for gingivitis and I think it has been pretty clearly shown that pyorrhea has a cause

in gingivitis. I am not unmindful of the fact that pyorrhea has an amphibolous significance. I think there is often a constitutional cause in pyorrhea, at least in certain types, but I cannot stop to discuss that now; suffice it to say that mechanical irritation has a definite relation to gingivitis and gingivitis is one of the first stages of pyorrhea. Now if pyorrhea is one of the most common of all forms of chronic infection in the human mouth and harbors this organism which gets into the circulating fluids, the lymph stream and the blood stream, and establishes lesions throughout the body, I do not know of anything that calls more strongly for better mechanical dentistry than this single fact.

Chronic abscesses, apart from a small group of cases, have their genesis in faulty work in root canal technique. Root canal filling is one of the *difficult* things in the practice of dentistry and one of the most *important* things in the practice of dentistry, excluding nothing. The biggest problem in dental work to-day is the root canal and its management without any question at all, excepting the fact that the management of root canals is exceedingly difficult and often an impossible thing, if it is to be done properly. With all that discount, the fact remains that chronic abscesses for the most part are due to faulty work in canal technique. About that there can be little or no argument. Laying aside I say, or waiving for the sake of argument, the difficulty and all, that does not change the complexion of affairs at all. The fact remains that faulty root canal technique, faulty in any of its items, gives rise to these infections. Now that fault may be in a dozen things. It may be in over-filling root canals, it may be in under-filling root canals, it may be in sepsis introduced in root canal fillings, and frequently—I must say this—frequently I believe that these foci of infection around root ends have their beginning in the irritation produced by arsenic, used as the devitalizing agent, and by strong drugs introduced into vital tissue. I believe that when you place arsenic in the root canal of a tooth, that arsenic has no human intelligence; it doesn't devitalize tissue up to the apex of that tooth and then stop. When you get into that canal you will find a little bit of vital tissue, or you will find it all devitalized, and the chances are the arsenic has gone a little bit beyond the root and has devitalized the tissues at the root end, producing at least a definite irritation, and that irritation, of course, is responsible for the scar tissue. Anything you leave there multiplies and it makes scar tissue, and if you have nothing else you have at the end of that root a zone of lowered resistance. Perhaps in the months or years to come in that zone of lowered resistance, produced by arsenic or strong drugs, you have an opportunity of a blood-born infection.

Now I am not at all sure that all these infections have their point of entrance through the root canal. I think some are blood-born; organisms in the circulating fluids get to these foci of lowered re-

sistance and there find a happy field in which to operate. The trend of lowered resistance, however, is produced by faulty root canal technique, whether it entered through the root canal filling or not.

Then a few words about diagnosis, and on this subject I can only speak in general terms. Let me say that the X-Ray should be a routine in dental practice. I am not unmindful of the fact that that is placing before the dentist perhaps a tremendous difficulty and one which for many local reasons he cannot perhaps overcome. That does not obviate the necessity. Just because you happen to be in a location where you cannot get the current or you cannot do this or that does not obviate the fact or does not minimize it one iota. The X-Ray or Roentgen Ray ought to be a routine in dental practice. It ought to be used as familiarly and be of the greatest necessity, as the most familiar thing you use in your office—precisely. It should be used when? First, it should be used to make a survey of discovery of every mouth when that mouth comes to you for the first time. I exclude, of course, from that general statement young children, boys and girls whose teeth are all erupted or vital pulps. I do not mean those, but in any mouth where you have any reason to suspicion a dead pulp, that should be radiographed, and that should be on that patient's record as long as you keep that patient in your practice or you keep the record. Then, at all subsequent times, when you treat the pulps of teeth by removal of a root filling, every one of those should be X-Rayed, absolutely, and if you have not done it, you will be surprised to find how many times you don't put in perfect root canal fillings.

If there is anything in the world that will develop accuracy in root canal technique, it will be to X-Ray all canals after you have filled them, and keep on X-Raying them until you get them done right. Make these Roentgenograms as long as may be necessary to check up long processes of repair, or where bone operations of any sort have been done, particularly those operations which are under soft tissue and are hidden from view. In all those cases pictures ought to be made at definite intervals to check up the process of repair, and the patient not dismissed until you are satisfied that the bone has completely repaired itself.

Now a word about the interpretation of films and plates. This is a fine art. The X-Ray is not absolute, it is relative only, and it must not be taken as the last word. The X-Ray is valuable in proportion as one has ability to interpret it, all things being equal. The X-Ray may mean a great deal to one man and not very much to another, and here again "a little learning is a dangerous thing." A person may misunderstand and misinterpret a radiogram and be misled or deceived, but I know of no way for a man to become expert in the interpretation or reading of these X-Rays, or radiograms, or Roentgenograms or whatever you may call them, than to persistently

develop in himself the ability to interpret it. And if a man will go about it conscientiously, emphatically and studiously and will spend time in reading all of these pictures that he makes or has made for him, and will check them up with his clinical experience, putting the two together, practically any man may in time become more or less expert in interpreting readings of X-Rays.

Now if one is going to have an X-Ray picture of a root of a tooth, it is perfectly obvious that the rays of the X-Ray should pass at right angles through the long axis of that tooth. If you are going to get a proportionate picture of a body the X-Rays must pass at right angles to the long axis of that body. Of course that is not always possible, and I recognize all the difficulties in the formation of the mouth, but as far as that is possible it is necessary, and the deviations from that angle must be kept in mind in the interpretation of these films and plates. Now if your tooth is elongated that means one thing in connection with root canal fillings. If it is, on the other hand, shortened it means another thing. For instance, if you have a single root tooth and the pulp chamber only of that tooth were filled and none of the root at all and you took an X-Ray picture in direct relation to the long axis of that tooth you would have what? The root shown as completely filled. If you take it, on the other hand, at right angles to the long axis of the tooth, you will show just exactly to what extent that root canal is filled. Now I say deviations from that right angle plane must be kept in mind, and must be borne in mind in determining, as far as one may, to what extent the root canals are not filled. Then in the multiple rooted teeth, on the upper molars for instance, or the lower molars, one canal may be completely filled and that canal may mask an opposite root which is not filled at all,—the lingual root may be masked in the upper molars, and so forth.

The relative density of hard tissue is one of the most important things to be borne in mind I think. When one looks at an X-Ray plate from an X-Ray film he should never look at the thing for which he is looking, first. One thing I learned as an intern under the late Nicholas Senn, one of this country's greatest surgeons, was that in approaching a case one should have his mind absolutely open, that he should not be prejudiced or biased, and the way to do that, was to get a perspective of the case first, and not to make local examination and then general examination, but to go over the body first and approach the thing from afar. Because if one makes a close examination of a given thing and then gets an idea in his head and then examines his patient he still has that idea in his head all the time. I think clinicians sometimes make a mistake in not getting a perspective first, and you must do that in your interpretation of the X-Ray plates and films. Look first at the perspective and get a conception of the relative densities in the whole field you see, before you look at a given part of that picture. It is a record of relative densities,—that

is all an X-Ray plate is. It gives you an illustration of the relative density, and if one does not bear that thing in mind he can miss an important foci of infection. For instance, an infective granuloma may not be seen at all. If you will remember the structure of the jaws in certain locations where the bone is very big, the inner plate and the outer plate, and a large area of spongy stuff in between. You can have a large focus between those two dense shadows of bone and miss it entirely, unless you get an interpretation of relative densities, unless one of those plates is encroached upon by your infected process, or unless the light relieves the density of that plate. Your X-Ray film may not mean much to you, unless you look at it exceedingly carefully.

Then the diagnosis of pyorrhea, specifically speaking, I think the diagnosis of pyorrhea should be made only on the basis of Roentgenology. I do not think any man can make a diagnosis of pyorrhea, and when I say diagnosis I mean an estimation of tissue loss, by looking into a mouth and putting a probe in and finding a hole and calling it pyorrhea. That is not a diagnosis! When I say diagnosis I mean an estimation of tissue loss, of tissue involvement with some conception of possible treatment and repair. That is all included in your diagnosis, and based upon the accuracy of your diagnosis can you prognosticate or intelligently treat a given case. Now with this statement let me repeat that the diagnosis of pyorrhea can be made only by the aid of good X-Ray pictures, because the question of treatment, the question of repair, the question of either saving or extracting a given tooth or teeth is contingent upon one thing and one thing only. That is the extent to which the periodontal membrane has been destroyed. That must determine whether a tooth may be treated or whether it may not be treated. There is no way you can determine the loss of periodontal membrane except by getting X-Ray pictures and you cannot do it absolutely even then. You cannot get an accurate picture of a tooth taken from any one angle. Now that is particularly true of septic foci, chronic infections or pyorrhea. Take a long central incisor as an illustration, with infection running clear to the apex, which ultimately destroys the life history of the usefulness and safety of the tooth. You may take an X-Ray picture from the posterior diameter of the tooth and not see a particle of the destruction. The same way you may have a root of a tooth, for instance, and on the lingual surface of that tooth have quite a perceptible bone lesion, and yet an X-Ray taken from the diameter of the tooth will mask the lesion sometimes completely. So that to get an accurate estimation of tissue involvement one must have X-Ray films made of teeth in more than one angle. If the pyorrhea is on the lateral surface of roots then your X-Ray film will give you an estimation. If, however, the pyorrhea has its greatest destruction either on the lingual or labial or buccal surface then you must have films made from several angles.

Now I said a moment ago that the extent to which the peridental membrane was destroyed must determine whether or not a tooth ought to be saved, or may be saved, or whether it should be extracted. I am not going to make any arraignment of so-called pyorrhea specialists, I am not going to discuss the question of the treatment of pyorrhea at all. I haven't any argument against the intelligent reasonable attempt to save teeth which are not a menace to the real life of the individual, that is commendable,—but I do want to say a word of warning against any attempt to save teeth when a large portion of the peridental membrane has been destroyed by any process. Suppuration existing for a long period of time destroys the cementoblasts, and once a cementoblast has been destroyed there is no way under heaven that the peridental membrane will become re-attached to the tooth root except through the agency of the cementoblasts, and where you get a case where the cementoblasts have been destroyed that tooth has ultimately lost its function and safety, to any appreciable extent, I mean.

Now what may we do? One may go in there and apply either the old or the new method of sealing and polishing and removing the tartar deposits, planing—so-called—and I would like to stop long enough to tell you what I think about this process of planing. He may plane, he may stain, he may squirt, and he will for all practical purposes, possibly, disinfect the tissue. Now, what takes the place of that bridge between the tooth root and the surrounding bone, or the thing that takes its place in the body—scar tissue, ubiquitous scar tissue, connective tissue. Now, these embryonic cells form and they elongate and they form fibres, and as those fibres grow old, they contract. The scar tissue always does that, and usually in a lineal direction. It is usually a long axis contraction wherever you find it in the body. There is many a doctor following your devious technique in surgery. Now, what does that do? It simply contracts around that tooth and holds it like a vice. But there is no biological contact between that scar tissue and the root of the tooth whatever, there is no union whatever. It is just an apposition, it is not cohesion. It is an adhesion. Now, each infection is really perpetual. A case like that is a perpetual meal ticket, a return, (Laughter) and you wonder sometimes, "Oh Lord, how long will men do these things." Do not misunderstand me. I believe in judicial management in select cases where the facts warrant it. Where the loss of tissue is not great and where there is no menace to the health of the individual, in those cases the teeth should be saved. And if I should leave the impression (and I have done it more than once) that I am against saving teeth, that is not so. I believe in saving every tooth that can be saved with safety to the patient, and that is better for the patient than any artificial substitute. Just so long as that is true and the health of the patient is not in any way in danger or encroached upon, then teeth

should always be saved. But I count it not less than a crime to save any tooth which jeopardizes the health and comfort even of the life history of a patient. It is a pretty serious business to put the health of an individual over against a tooth or all the teeth.

Now, the diagnosis of chronic abscesses is begun in the same way that we first diagnose that of chronic pyorrhea. You must consider the extent to which the root end of the tooth has become denuded and has become defaced. And in passing let me tell you this, that I do not believe that one may introduce through the root canal any material which is going to go over that roughened root end, cover it, and protect it with safety. I do not believe it. I do not think you can introduce any foreign substance into the body and have that foreign substance become incapsulated in an infected field with safety. I think on general principles just ordinary commonsense will condemn the thing on its face. If you have in the jaw an end of a root of a tooth, from which the peridental membrane has been destroyed, the end of that root has been liquified more or less, and that portion of that root is a foreign substance which must remain as such until it is removed. Now, it should be removed or it should be treated either by re-section, which is done under well defined conditions, or by the removal of the tooth itself. I do not think there are any other ways of treating the end of a root of a tooth, and just in passing let me say that I think the instances in which re-section may be done are very few. (Hear, hear).

Now, the presence or the absence of a fistula is of no consequence at all. The suppurative symptoms bear no relation to its danger. The smallest conceivable focus may be of tremendous danger, where an abscess in which one would get a different quality of pus may not be of any serious danger to the patient's health. You might get an abscess where you could get a quart of pus and yet not be dangerous. Yet you may have in other parts of the body a focus so small that you cannot find it, and in that focus there are being propagated a cycle of bacteria which will destroy the patient's usefulness. So do not be deceived about these lesions. The size of a focus bears absolutely no relation to its danger. It is the *quality* and not the *quantity* of the bacteria that determines the danger. Because a focus looks small one may be constrained to adopt conservative measures of treatment, and because a focus looks large one may be constrained to be radical. That premises does not hold, for the size of a focus does not measure its danger. Men have been deceived, and men are being deceived to-day, in the treatment of these chronic abscesses in process of medication. The case comes to you or some other fellow—not to you, because you do not do that sort of thing—but a case comes to the other fellow and the patient says I have got a gum boil, and you know the life history of a gum boil. It is perpetual. It is just like a crater, it fills up and bursts, and then it

quiets down, and it goes through that cycle of changes and starts all over again. You thoroughly understand all that. Now, the other fellow opens into the root of that tooth and he seals in whatever he is in the habit of using, and the patient comes back and says that feels better. Of course it does. Why shouldn't it? And you put in another treatment, and the patient goes away and comes back and you give him a few treatments. I mean the other fellow does. You do not do that sort of thing, but he does. He keeps on treating it and then after a while he says it is all right and he fills the root canal. Clinically it looks all right. The tooth is stable, there is no tenderness, the membrane is not giving any trouble, the fistula or sinus has disappeared, (whichever you call it here), pus does not evacuate, the parts have quieted down, that high color has left, the gum becomes normal in appearance, evidently a normal circulation has been established, and you pronounce it a cure. Now, the probabilities are that in the majority of those cases you have converted a safe abscess into a dangerous one. In one instance it was open, it was evacuating and the pus was ejected from the body. You simply do enough disinfecting by treatment, until it heals over and a sheath forms around that, and it is evacuating into the circulation now instead of on the street. That is the only difference, and I would rather have pus on the street than in my blood stream any day, even if it is against the law to expectorate on the sidewalk. If you will take X-Ray pictures of those cases you will find they are not healed. So the other fellow has done that sort of thing and after a while he has put on a beautiful piece of bridgework, perhaps a 14-tooth bridge on three abutments, and the patient comes back in six or seven or eight months or a year and he says, Doctor, this gum boil has come back again. Of course it will come back. Now, both the pyorrhea and the chronic abscess are focal possibilities. I am not saying to-night that every case of pyorrhea contains a virulent streptococcus that is perfectly sure to get into the circulation, and perfectly certain to localize some place, and perfectly certain to wreck havoc on a patient's life. I am not saying that at all. Neither am I saying that, about the chronic infection. I am only saying this, that the chronic abscess and the pyorrhea are both chronic foci, and that infections do occur and occur in many instances from these foci. Of that there is no question at all. Now, we treat them all either as active or potential dangers, all of them. We cannot do anything less than that. We cannot presume upon the health of any individual. For instance, to-day a man may be in apparent perfect health and he has an abscess in his mouth. He is as strong as an ox and he laughs at the possibility of danger, and you laugh at the possibility of danger, and you will cite those cases. I know that many men and women have chronic foci in their bodies. There is no doubt about it. They go along for years in a state of apparent perfect health, and a man

may have a tonsil or appendix or a gall bladder in a state of chronic infection, sub-normal, no active symptoms, nothing of the sort, he is in the pink of condition. He may have in that appendix or in that tonsil or in that abscess in the jaw a streptococcus and it may get into the circulation. The defences of the body are good and he fights it and controls it from day to day. But let something happen in that man's physical economy, when he passes the zenith and is going down on the other side, when his combative influences are on the wane or when he has some undercurrent of infection, even a so-called influenza infection, or something that breaks down his defences and reduces his fighting capacity and then the streptococcus gets in its work, and the fellow that you pass over because he was in good health some day falls a prey to infection that you—not you but the other fellow—left in his mouth, because he assumed or presumed on that man's physical vigor and perfection. We have no right to presume on good health. We have no right at all because a man to-day is in perfect condition and we find pus in his body, that we may leave it. I think it is only a sane, sensible position to take, that wherever we find infection in the body it ought to be removed, particularly when the potentialities are so definite as they are in this class of infection.

Now, what teeth should be extracted? I don't know, and I am not going to tell you. I can only say this, that you ought not to extract a tooth which can be made of greater service to the patient than an artificial substitute. That word "service" is composite in my mind. It involves comfort and function and safety. If that tooth can be made more comfortable and of better service and functionate better and be perfectly safe, then it ought under no circumstances to be removed. Under no circumstances should it be allowed to remain if it jeopardizes the patients' interests. Now, we extract teeth both for pyorrhea and chronic abscess on the basis of the extent to which the vital and important part of that tooth is concerned, and that is the peridental membrane. If I were to postulate or be dogmatic I might say this, that I would extract all molars and bicuspid which were seriously involved in either one or the other type of infection. I say seriously involved—do not misunderstand me.

Then you asked me the question, when may one re-section root ends? Just once a year. Make it a holiday occasion. Now, I have done a lot of root re-section, and the older I get and the more sense I get, the fewer re-sections I do. I may tell you that honestly and sincerely. There are several reasons for that. Every time you do a re-section of that kind you do several things. First of all you open up the lymph space, you open up blood vessels and you get into perfectly immune tissue, (you get into tissue which nature has walled off and protected in her own way), and give opportunities for chronic infection, opportunities for that infection to get into the circulation to a greater

extent than before. You make a rather pretentious wound, considering the tooth itself and its surroundings and its tissues and character. Only a percentage of such cases go on to complete repair. What that percentage is I don't know. Re-section may be done only with safety in anterior teeth, and that largely in the upper jaw. I do not exclude the lower jaw entirely, but it is not so easily done or successfully done. Even when the X-Ray shows that repair has apparently taken place, we do not know that all the infection has been eliminated from the area. I say we don't know that. I have had occasion a few times to extract teeth that had been re-sected. I have done some experimental work. I have extracted teeth that had been re-sected in which to all intents and purposes repair had taken place, and when those teeth were taken out there was a little bit of membrane around the end of that tooth that contained a very definite and very active streptococcus. Now, if you just look at it for a moment what do you find? You have rather a wide surface of a tooth which you have cut off. Will that form a definite union with the surrounding tissue, or the bone fill in? Will it fill in and become organically related to that antiquated stump? If not, the surface will be filled by what? By scar tissue. I know myself that, if it were my own mouth, I should have the tooth taken out in preference to any type of re-section,—any single tooth in my own head. I am not condemning re-section of roots, but only say this from my own experience. The older I get the less I do of it. I have done a good deal of it and I have been ashamed of it more than once. Secondly, extract all teeth in which the root canals cannot be successfully opened up, disinfected and filled. I think I ought to make that in the form of a thesis. Extract all teeth which are the seat of chronic infections, the root canals of which cannot for one or a dozen reasons be successfully opened up and disinfected and filled.

I have tried to say in a word that you should face every patient as a minister of righteousness to the extent that we should not dismiss that patient with any infection not removed. That means, I think, we are going to extract more teeth than we have been extracting. I really think it does.

Let us stop for just a second and think about it. Supposing, for the sake of argument, that every man in this room to-night is highly skilled in root canal technique. I am doing this for the sake of argument. (Laughter). I am taking it for granted that every man here is highly skilled in root canal filling, and that every man in this room is big enough and fine enough to recognize his responsibility in taking care of poor people. I have said it before and I will say it here to-night and I will keep on saying it, that I have not much respect for a man who locks himself up in the confines of his office and gives all his time to people who can pay. I think he is a mighty poor citizen. A man who is not willing to take his share in the care of the poor and unfortunate ought not to be entitled to citizenship even, (Hear,

hear), to say nothing of his credentials to practice the profession. So if you are all skilled in root canal technique and you recognize your responsibility to the unfortunate people about you and you are perfectly willing and you do try to take care of the poor people who come to you, as far as it is reasonable at least, what percentage of the poor people will you take care of, and what is going to become of all those people that you cannot take care of? What is going to be done with them? What is going to be done with all these foreigners who come to our shores? What shall we do with them? There are three or four men in this country, and that is all we need, who rather maintain they can do absolute root canal work. All right, I suppose they can. I had occasion to answer a letter not long since, (and this is illustrative now or else I wouldn't use it, I don't know how else to make my point). I had occasion to answer a letter from a patient wanting to know what man in a certain large city I could recommend for root canal work, and I wrote recommending a man. This patient went to that man. This patient is well to do. The X-Ray pictures showed there were seven or eight teeth with either suspicious areas or definite infection. The patient said, now, I would like some idea of what this means, and this gentleman went over all the facts and explained the whole situation to the patient. He told the patient on enquiring that it would cost \$100 a tooth for the root canal work alone. Now, that man is preaching a high-toned gospel of root canal technique. My point is, how many men are there, seriously speaking, in the dental profession who can do highly skilled root canal work? You know as well as I do there are not very many. There are not very many who have the aptitude and the peculiar skill to get into these difficult canals and work perhaps three, four or five or six hours until they finally get them open. How many patients could pay for that kind of service? Not very many, and when you exclude all the men who cannot do highly skilled root canal work, and the patients who cannot afford to pay for highly skilled root canal work, where do most of the people get off? I know no other way to face it than that; to measure the possibility of skill in a highly skilled profession and the ability of the people to pay for that high degree of skill, even assuming that all of the men are willing to do their utmost to help the unfortunates. I say you have a large proportion of the people on this Western Hemisphere who are going to do without highly skilled so-called root canal technique. Now, what should be done with those teeth that are infected in this great class of people? I think you will extract a good many teeth.

At the close of the meeting a hearty vote of thanks was presented to Dr. Moorehead, and the appreciation of the Society was expressed by a number of those present.

The following gentlemen took part in the discussion of Dr. Moorehead's address: Drs. Risdon, McPhedran, Detweiler, Secombe, Webster, Price, Clark, McDonagh and Willard.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE INTERPROXIMAL SPACE AND THE CONTACT POINT.

WHAT is the best thing to do for the patient who complains of food packing in between the teeth although no cavities are present, and how do you account for this condition? If you have had any difficulty with cases of this kind, read Dr. C. N. Johnson's article in *Dental Register* (August), for herein is contained much that will be of great assistance in the treatment of this condition.

Following a detailed description of the appearance of the interproximal space, the author explains its peculiar usefulness: "The form of the gum tissue which fills the interproximal space performs an important function in the process of mastication. The gum tissue is in the form of an arch bucco-lingually, with the crest located at the contact point, and the slope of that arch is a wonderfully efficient provision in the process of the comminution of food. The food, when taken into the mouth, is divided by the teeth: part of it goes buccally and part lingually, and is gathered up against the surfaces of the teeth by the tongue on one side and the cheek on the other, and we find a continuous process of cleansing by the friction of food over the enamel."

The contact point, even between the large molars, is not large and fiat as is often supposed. It is the smallest possible contact, and is for the purpose of guarding the interproximal space and dividing the food. The food is forced buccally and lingually. "It is there," says Dr. Johnson, "for the purpose of protection of the gums in an entirely different way. You might say an individual might have teeth so tight together that food could never wedge between them. There is an individual movement in all teeth. It is impossible to build teeth so tightly together that at times fibres of food will not pass between the contact point. If we have a broad contact point, we will have those fibres held between the teeth; if we have a small, rounded contact point, they will not be held there, but will pass down into the interproximal space and the next excursion of food will wipe them out and we will have that space kept clean, so that

the maintenance of a proper interproximal space is absolutely dependent on a contact point of proper form."

When the contact points of the teeth are faulty there is greater danger of caries upon the proximal surfaces, because there will be a slight dropping in of the tip of the crest of the gum tissue in the space, inverting the arch, and food readily lodges in this space. Caries follows on with more or less rapidity. By way of illustration, the author selects the case where the first permanent molar has been lost, causing the second molar to tip forward with loss of natural contact—a condition that is altogether too common. The interproximal space loses its correct form and becomes filled with gum tissue. Frequently a carious cavity is found under this tissue and rapid destruction of the tooth follows unless corrective measures are taken. It is well to keep this possibility always in mind, for it is a fact that few operators explore this surface of a tooth when making examinations. Push the gum tissue aside and investigate the space for a possible cavity. Many times the patient's trouble may be located here.

Dr. Johnson believes that many cases of pyorrhea alveolaris "have been induced in the first instance by faulty proximal contact and abnormal interproximal space: from food wedging in between the teeth that brings about, sooner or later—sometimes in a long time, sometimes very soon—a pyorrhea pocket, and you may have many cases of pyorrhea pockets beginning in the interproximal space, yet never recognize it."

To remedy a faulty contact point, filling material may be used. Amalgam limits the possibility of correct restoration because it is not hard enough to withstand the constant rubbing against it of the adjacent tooth without becoming more or less flattened. A gold foil filling, well condensed, is better, yet does not meet the requirements of the case as well as does the gold inlay. As a filling material for securing ideal contact points, the gold inlay is far superior to any other. It should fit as tightly as possible even though its insertion prove uncomfortable to the patient. If a tightly fitting, or one might say an overly large gold inlay, is placed in a proximal cavity the contact points all along the arch will be tightened. The contact point on the inlay may be made of 18-carat solder, flowed over the 22-carat inlay. This gives the required hardness to withstand abrasion.

Taking up the relation of imperfect contact points to pyorrhea, Dr. Johnson says: "In adult life we may have such a wearing on the proximal surfaces of the teeth that there is more or less opportunity for food to wedge between the teeth. This is a condition which no patient would tolerate any length of time if brought on suddenly, but as it comes on gradually we are apt to tolerate anything. It is our duty to discover that condition. If we find a patient with a condition of this kind resulting in pyorrhea pockets, the first

thing to do is to correct the contact before you begin your treatment of the pyorrhea. You will make no progress at all in these pyorrhea cases if you permit the food to wedge between the teeth upon the gum margins."

Before attempting to secure the impression for the inlay, the teeth must be well separated. Ordinary base plate gutta-percha is used for this purpose. This material is found to be better than India rubber because the latter "has a tendency to creep up into the interproximal space and injure the gum." Spring the teeth with a separator and then pack the gutta-percha into the cavity, always being careful not to injure the gum tissues. In two or three days sufficient separation will have been obtained to allow for the taking of the impression.

When a patient complains of discomfort from food lodging between, say the lower bicuspid, and where the contact points of these teeth are apparently in good order, look at the opposing teeth and note if their cusps are in normal occlusion. The opposite tooth may be tilted somewhat and a cusp, as the author explains, "form a wedge," which forces the food into the space. Careful grinding of the cusp in such a case will correct matters. That prophylaxis, as commonly practised, may have a positively injurious effect upon the contact points of teeth is the claim advanced by Dr. Johnson in an editorial appearing in *The Dental Review* (October). He finds that in many cases the contact points on the proximal surfaces of teeth and fillings have been ruined by cutting them away in the practice of prophylaxis. More harm than good is being done by dentists who pass disks and sandpaper strips between the contact points of teeth, cutting them down "so as to narrow the mesio-distal width of the teeth and loosen up the contacts." It is possible that if the so-called prophylaxis measures are persisted in, pyorrhea will become vastly more prevalent than it now is, for as it has been pointed out above, with the destruction of normal contact pyorrhea pockets easily occur about the teeth.

That this subject is of more than passing interest is evidenced by the view taken by Dr. C. N. Johnson, published editorially in his dental journal. He says, in part: "What the profession most needs is breadth of vision and comprehensiveness of thought so that they may see and think beyond the narrow bounds of the immediate thing they are doing. There is something else besides making a tooth smooth. It is infinitely more important to maintain the normal function of mastication, and this cannot be done by cutting away the contact points. In fact, be it said, the main factor in keeping the enamel polished smooth is the full process of mastication. The surface of no tooth is ever satisfactory unless wiped constantly by friction of the natural processes in the mouth, such as food in mastication, the friction of the lips, tongue or cheeks. We aid greatly in some

instances by legitimate prophylactic measures, but we are never able to wholly compensate for loss of function as expressed in impaired masticating efficiency. When prophylaxis is practised let it be done conservatively and judiciously, and let us see no more of the havoc that is being wrought by deforming the teeth."

COPPER CEMENTS.

Of all the various dental materials least has been written about copper cements. This is somewhat surprising, because many practitioners, who have been close observers of its properties, speak highly of its suitability as a filling material. From among those who find merit in this cement we might select Dr. Francis E. Burnett, of Chicago, who presents its good qualities in an article appearing in August issue of *The Dental Review*. He finds that probably no other single agent used in dentistry can accomplish so many different things, in so satisfactory, positive and definite a manner. The operations it is made to perform are dependable, exact results are gotten, which can be measured and contemplated. Such is the claim advanced by Dr. Burnett, and he proceeds to analyze the properties of copper cement in support of his contention.

It is pointed out that copper cement acts not only as a cement proper, but also reaches down into the tooth structure and extracts from the half-decayed enamel rods and dentin, the serum, and returns instead a dark coloring matter—the copper salts. These salts have a tendency to keep a dental pulp healthy. Seldom do we find decay progressing in that portion of the tooth structure which is brought into contact with the copper cement filling.

Owing to the ultra-adhesiveness of copper cements, less cavity retention is necessary. This is important in the case of badly broken down tooth tissue because of the minimum amount of loss of tooth structure required. The author believes that this property of adhesiveness is due, in part at least, to the fineness of the copper oxid granule. He suggests that in cases where trouble is experienced in getting a crown or bridge to take a grip of the tooth that copper cement be used in place of the commoner zinc cements.

It is often claimed that copper cement is the hardest and densest of dental cements. Dr. Burnett finds no reason for doubt along this line, for, says he, "The red oxid (copper) is baked until it turns black, care being taken that it does not suddenly return to the metallic state. Its nearness to that state, as compared with the zinc oxid, has to do with the hard nature of a copper cement. This very fact suggests its suitability for use in preparing abutments for crowning.

Its use is particularly indicated in sensitive buccal cavities where, in addition to acting as a filling, it also prevents both pain and decay on account of its copper salts penetrating the tooth tubules. Little hope can be held out for the performing of complete dental opera-

tions for children, and it is advisable to make whatever dental treatment we are capable of giving as lasting as possible. Copper cement is particularly applicable in just such cases, because of the preserving influence of the copper upon the tooth substance.

Decalcified dentin adjacent to the horn of a pulp may be made sterile by reason of the penetration of the salts from the copper cement filling. In this way the operator may be able to save many dental pulps which otherwise would be lost if a filling material of a different nature were used.

No matter how careful one may be, it falls to his lot sooner or later to treat a case of root canal puncture. How may this be done? Dr. Burnett suggests copper cement as a remedial agent. "It is at once a germicide and a soothing agent to the peridental membrane, also it is the one of all agents that will lie sealed in such a place." Its use may also be extended to the correction of cases of bifurcation of a tooth. Even in cases of split roots of teeth it is said to be very efficacious, and the author suggests in this connection that the fractured parts of the root be brought together with a band and copper cement forced in in such a way that it will flow into the fracture and fill up all the space even to the peridental membrane. Many teeth may be saved for crowning if such a method be adopted.

We quote from Dr. Burnett's article to show how copper cement may be used in some extreme cases and bring about satisfactory results:

"In some very badly decayed first permanent molars, after only superficially removing the decay, a regulating or any other band may be hastily attached to the tooth, and the crown surface liberally filled with a creamy mix of copper cement. The effect will be to reduce the sensitiveness, sterilize the part and tide the tooth over until more thorough work can be accomplished. Decay will not return or advance from the copper cement filling. The band may be removed or not and the tooth dismissed for years. At a later date the gums will have receded, the stump made healthy, the apex become normally constricted and permanent work invited."

The most satisfactory results are obtained by the use of cement which is made from pure copper. Some cements sold as copper cements contain approximately three-quarters zinc oxid. This latter brand of cement is not as suitable for dental use as is the pure copper cement.

The general question of the action of copper salts on low organisms receives attention in the *British Journal of Dental Science* (September). Researches along this line have been carried out in the physiological laboratory of King's College. The task set out was to determine the manner in which the action of these salts, say on many algae, was carried on, and the best form in which to administer copper subcutaneously or intramuscularly. The incompatibility of

the ordinary salts of copper with the body fluids has rendered their use rather limited. "Dr. Manara, of the Casalmaggiore Hospital, has recommended the use of 1 per cent. ammonia-sulphate of copper in cancer, in which he has employed it with good results. This solution does not keep well, but the addition of a small amount of amino-acid kept the solution clear and sterile. This led to the preparation of copper compounds of the amino-acids, especially amino-propionate and copper amino acetate." Preliminary investigations as to the bactericidal action of copper compounds of the amino-acids (copper alanine) on low animal organisms appeared to be very marked. The protozoon *Opalina* was destroyed by a solution of 1 in 200,000 in eleven minutes. Copper sulphate destroyed the same organism in sixty-five minutes. Various other organisms were tested and the results tabulated. "The observations are distinctly interesting," says the author, "the human organism is not very susceptible to the action of copper, and comparatively large doses can be given in the treatment of dysentery and other conditions due to protozoa." It would be very interesting indeed if some of our research workers would determine whether these salts could be rendered of use in the treatment of pyorrhea-alveolaris.

An exhaustive article on copper cement, by Dr. Marcus L. Ward, is published in August issue of "*The Dental Review*." A report of this paper will not be attempted in these columns, both because of inability to do justice to so elaborate a treatise, and because it would necessitate introducing certain manufacturers' products for criticism. This we consider to be beyond the scope of our journal. However, those interested in the subject of copper cements, are strongly advised to look up Dr. Ward's report.

DENTAL PATHOLOGY.

The curricula of our dental educational institutions are in more or less of an unsettled condition owing to the attempt at selecting subjects calculated to best qualify dentists for their life's work. It is safe to say that one subject of study to which greater attention will be given is that of Pathology. We need more dental pathologists if our profession is going to keep pace with the times.

Kindly criticism of our profession is always welcome, because by its means we are enabled to discard the useless and place emphasis upon the essentials in our work. He who roundly denounces prevailing conditions as worthless and offers no suggestions by way of remedy is just a critic—not a reformer. Reformers accomplish the most good in any community.

The reason for this preface is that we have just reviewed an article written by Eugene S. Talbot, M.D., D.D.S., of Chicago, on "Why Dentists Are Not Pathologists," (see *Dental Summary*, page 490), in which he speaks of dentists in terms calculated to make us feel a great

deal less of our position. The author, it will be noted, is both a dentist and a medical doctor. It would perhaps be more pleasing to him if we said that he was first and foremost a medical doctor and secondly or incidentally a dental surgeon, for he appears to attach little glory to the latter degree. It is for this reason that we do not know quite how to classify the author—assuredly he is a critic, but is he a critic and also a reformer? We will let the reader decide!

The object of his paper is to show why dentists are not pathologists, and why they cannot be by the present methods of teaching. "It is," he says, "as impossible to make shoes in an automobile factory, as it is to make automobiles in a shoe factory. The machinery is not adapted for the special work. The same is true in relation to dental schools and medical schools. We can no more make pathologists in the present dental schools, than we can make mechanics in medical schools. The aim and object of the faculty of a dental school is to turn out first class mechanics. The school is equipped for that purpose." He finds that if the aim of a school is to accomplish a certain object, it is difficult to introduce subjects foreign to that subject which will benefit the school or the student. The reason, therefore, why dentists are not pathologists, is that the dental schools aim to turn out mechanics, and not pathologists. The dental graduate starts life as a mechanic rather than as a professional man.

We are told that the treating and filling of the roots of teeth up to the present time has been conducted on mechanical principles. The medical profession is now exposing our tributes to pathological conditions. A glaring example of our ignorance of a knowledge of pathology is cited. We call a disease which produces absorption of the alveolar process and loss of teeth "Pyorrhea Alveolaris," when "pyorrhea has nothing to do with the etiology or pathology of the disease." Dr. Talbot has no sympathy with our absurd methods "of dental practice in treating interstitial gingivitis by instrumentation. He says "there are many men, some of them teachers, who with 150 or more instruments will gouge and injure the tissues about the roots of the teeth regardless of whether calcic deposits are present or not. The suffering of the patient under such treatment is inexcusable."

Reference is made to some schools of special instruction as follows: "There are schools in this country in which, for \$175.00 the teachers agree to educate dentists in four weeks, how to "cure pyorrhea to their entire satisfaction" by the use of a large number of instruments, for which an extra price is charged. It is immaterial whether the disease is due to calcic deposits, tuberculosis, indicanuria, heart lesions, syphilis, kidney troubles, auto-intoxications, acidosis and other constitutional conditions producing stasis of blood, a lowered vitality, and want of resistance. It is surprising how many graduates of dentistry are taking the course." The readiness of the dentist to

grasp at such methods of treatment is thought by the author to be due to the fact that dentists having been trained as master mechanics naturally like to treat diseases by mechanical means. We are charged with manufacturing beautiful pieces of jewelry work and placing same in the form of bridges and crowns upon roots regardless of the pathological condition of the roots and surrounding structures.

"The dentist," says Dr. Talbot, "is producing more pathology in the mouth by their mechanics than any other one cause."

So much for the charges against our teaching methods. Now for the remedy. It must be in the nature of a revolution from the practice of the mechanical to the pathological. Dental students must not consider all studies not purely mechanical as non-essentials. "Instead of the faculty basing the qualifications of the students to graduate upon proficient mechanics, such as artificial dentures, crown and bridge work, a given number of gold, amalgam, cement and other fillings; phylogeny, embryology, ontogeny, histology, and pathology should be the subjects aimed at, since the mechanics of dentistry are only for the purpose of restoring pathologic conditions. Some of us saw the pathologic vision 40 years ago and we gave up the practice of dentistry for the time being to study medicine; we have never regretted it. The pathologic vision is now in our midst, and no dentist is so blind that he cannot see it. The medical profession is seeking the services of those dentists who possess a medical education. They are already tabooing the average dentist as being unskilled in his profession. Pathology is based upon the fundamental principles of medicine. The student should matriculate with the medical students and pursue the same course of instruction for the first two medical years. Our profession is about to pass through the greatest scrutiny in our history, due in a majority of instances to faulty methods of dental practice. The medical profession in the past two years has discovered that a large majority of the obscure diseases, which they have heretofore been unable to diagnose, are actually due to focal infection in the mouth and about the teeth. Dentistry, as practiced to-day, was born in iniquity and sin with a breed presentation—ignorance. If the profession is to accomplish anything and hold its own with other specialties it must be born again in the natural way with a head presentation, full of brains, to reconstruct our present faulty methods of practice. Demoralized by mechanics we have lost sight of the "pathologic vision."

This is a rather severe arraignment of our profession. Is it deserved? Think it over and let us have your opinion.

PROFITABLE PRACTICE.

Dr. George Wood Clapp, of New York, published a book under the above title which has had a wide circulation among dentists both in America and Great Britain. We confess having had a feeling of

curiosity to know what dentists in England would say about this publication. Expressions of approval are given in the *British Journal of Dental Science* (November), and we are agreeably surprised to know that they do not think that we on this side of the Atlantic are as commercial in our practice as we were sometimes led to believe.

We will quote from the above journal to show how dentists in the Old Land view this subject. "There are two sides to practice, the purely scientific one and that which is conceived with the commercial aspect of the work. Dentistry is not pursued for the love of the thing or upon purely philanthropic lines any more than is law, or cattle raising. We, like our medical brethren, pride ourselves upon a strictly professional code of ethics and the glorification of the science of our calling. It is a mistaken view of ethics to say, as formerly was advanced, that "the dentist should devote his whole attention to the professional (i.e. scientific) side of each operation, with no thought of the amount of its fee or the manner of its payment, and that the fee for any operation should be whatever the patient can pay." We must accept the fact that when a dentist undertakes any work for his patient he enters into a contract with him to carry it out with skill and knowledge. On the other hand, the patient must be taught to recognize that his side of the contract imposes upon him the obligation to pay for the particular class of work he demands and to do so promptly. It may appear to some that chaffering over work and payment introduces an unpleasant trade atmosphere into the professional relationship between patient and operator. We imagine that the citizens of the United States take a more commonsense view of such matters. "Time is money," is an accepted truism over there as it is here, but they are prepared to carry out in practice what we are inclined to accept only in theory. If elaborate and time-absorbing operations are called for the fee must be commensurate; if trivial matters are in question, or the kind of manipulation requires a small expenditure of time allotted to chair and laboratory work, then small fees suffice. To be imbued with the very laudable ambition to do only the very best work and employ the most recent methods and most costly materials is salutary, but if the tyro carries out this ambition into practice in dealing with all sorts and conditions of men he will soon find his ledger balances upon the wrong side. The pity of it is that his failure to "make good" is inexplicable to him. He girds at Fate because, having essayed to do the very best for his clients, he finds himself a bankrupt and a broken man." A dentist is adding nothing to the profession who places too low a value upon his services. The public is very apt to take you at your own valuation and hold a like opinion of the entire profession.

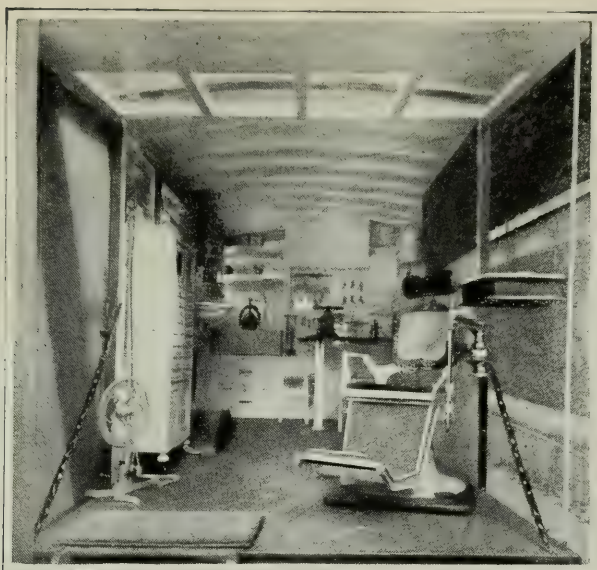
Travelling Dental Surgery in the French Army

THE travelling dental office, illustrated in this article, was recently devised by Dr. M. Gaumerais, who is attached to the Hospital, No. 81, in the French army in the capacity of Adjutant. This equipment is known as the *voiture de stomatologie*, according to the *Scientific American*, and is installed in an automobile bus of a standard model used in the French army. The interior is of sufficient height to permit the men to stand erect. About two-thirds of the depth on one side is occupied by a cabinet containing all the necessary dental supplies and instruments, and the remaining space is devoted to the dental laboratory or workshop where the mechanical work of dentistry is accomplished. In the former portion is also included a standard chair, mounted on a platform provided with castors so that it can be moved about.



Travelling Dental Surgery now in use in the French Army

The rear end of the travelling dental office consists of an upper and lower half, both of which are hinged. While travelling the two halves are closed. When the shop reaches its destination the two halves are opened; the upper one forms a roof and is equipped with glass windows, which act as a skylight, while the lower one, supported by side chains and iron rods reaching to the ground, provides additional floor space. It will be noted in the illustrations that this feature causes considerable space to be added to the dental office when the automobile is at rest, and that the extended portion can, if desired, be inclosed by using canvas curtains. It is in this extended portion that the movable dental chair is brought, where the dentist will have plenty of light to aid him in his work on the patient. The



Interior View of the French Automobile Dental Surgery

accompanying illustration, showing the interior view, does not fail to disclose the completeness of the equipment.

According to official reports, this car was used for 1,800 dental operations of different kinds during a single month, not including 63 cases of purely mechanical dentistry. Unfortunately, the personnel of the surgery only includes Dr. Gaumerais, aided by a dentist and a mechanical dentist, hence the utility of the unit is limited in its scope. It would be necessary to multiply the number of automobile dental offices so that each unit could be devoted to four army corps, in order to render the proper dental care to all those in need of it.

The statement was made by Dr. W. C. Speakman that "Sixty thousand men had been kept at the French front by the army dentist." The army dentist is certainly now recognized as as much of a necessity as the army surgeon.

It was not that way at the beginning of the war. The British tried to restrict enlistment to the men with sound teeth, but the need was too great. The bars were let down. France took her men as they came even if they were toothless.

After the flurry of the first few months, war began to settle down into a business. The higher authorities listened to the surgeons who insisted that the wounded man whose teeth were diseased made a "retarded recovery." Men were sent home on sick leave whose only trouble was their teeth. When they were treated the men got well. It became evident that the soldier's teeth must be cared for. The army ration is an "iron" one, even when it does not come in cans. The man who cannot masticate and is forced to "bolt" his food loses strength and endurance, and if his teeth are diseased he is rendered liable to serious general lesions.

It has become the order to not only give the soldiers adequate dental service, but to give them that service right up at the front, and the result has been the establishment of this automobile dental surgery unit.

When the dentist opens his office in the morning he is confronted by from thirty to forty fresh sufferers. At his side or in tents attached to the outfit from two to six mechanics labor, making plates, teeth, and all the rest of the devices which make mastication possible.

Under the orders issued by General Gallieni when he was Minister of War, 1,000 surgeon dentists may be attached to the French army. The Gallieni plan was to furnish each division with dentists, in order to restore to duty soldiers who had been incapacitated by reason of bad teeth. They were given a distinctive uniform and the rank of adjutant sous-officer. Men holding diplomas as dental surgeons were taken from the ranks (where many of them had been employed) and put at work along the lines of their own profession.

Canadian Army Dental Fund

THE Treasurer of the Canadian Army Dental Fund, Dr. C. V. Snelgrove, 105 Carlton Street, Toronto, reports the following subscriptions to the Army Dental Fund of the Canadian Dental Association:

MANITOBA.	
Dr. E. C. Campbell, Saskatoon	\$ 10.00
Dr. W. H. Fallon, Saskatoon	10.00
Dr. G. B. Somerville, Saskatoon	10.00
Dr. A. P. Salter, Saskatoon	10.00
Dr. F. K. Switzer, Saskatoon	10.00
Dr. F. E. Skinner, Saskatoon	10.00
Dr. P. W. Winthrope, Saskatoon	10.00
Dr. Swartout, Saskatoon	5.00
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Dr. Crumbough, Saskatoon	1.00
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Dr. D. S. Howden, Moose Jaw	5.00
Dr. S. R. Martin, Moose Jaw	5.00
Dr. C. W. H. Skinner, Moose Jaw	5.00
Dr. E. D. Washington, Wolseley	10.00
Dr. F. R. Graham, Estevan	5.00
	<hr/> \$141.00
PRINCE EDWARD ISLAND.	
Dr. R. E. Island, Charlottetown	5.00
Dr. J. S. Bagnall, Charlottetown	5.00
	<hr/> \$ 10.00

Total received since last acknowledgment.

\$151.00

Further subscriptions will be gratefully received by the Committee. There are many ways in which this fund may be spent to the advantage of the Canadian Army Dental Corps, and those who have not yet subscribed are urged to do so at as early a date as possible.

A Census of Canadian Dentistry

Wallace Seccombe, D.D.S., Toronto.

WHAT Canadian dentist has not asked himself a hundred times, during the past two and a half years—Is it my duty to carry on my present work or don khaki and join some branch of the militia? The question recurs again and again, and we ask ourselves—In what capacity can I best serve my country and civilization in the present crisis?

Canadian dentists have been urged, through the pages of Oral Health, to serve as dentists, whether that service be in civil or military practice. This position was taken because of the unanimous feeling of those who were in a position to judge, that there exists a decided shortage of dentists in Canada which will become more acute as the war progresses. For the same reason, young men who had decided to enter upon a college course, were urged to choose dentistry rather than another profession, because of the present and future public demand for dental service. One result is almost a hundred members in the Freshmen class of the Royal College of Dental Surgeons of Ontario. These men will soon be available to the Dental Corps, in the capacity of sergeants or to act as assistants to dentists in civil practice.

Is this policy justified? Does the need really exist, and if so, is the profession justified in attempting to meet it? If not, by all means let the Canadian Dental Colleges be closed for the period of the war!

How are we to intelligently judge? The only way is a census of Canadian dentistry, to be taken at once. Statistics may thus be gathered embracing the following information:

(a) How many dentists were there in civil practice before the war, per thousand of population?

(b) How many dentists are there at present in practice?

(c) How many students are there in attendance at Canadian Dental Colleges, present standing, and year of graduation?

(d) Number of Dental graduates and undergraduates now serving, and estimation of future dental need, in both civil and military practice?

Oral Health proposes to ask the dentists of Canada to assist in procuring this information. It is hoped that co-operation will be so prompt that accurate results may be announced at a very early date.

Letters From Our Boys at the Front

No. 3 Casualty Clearing Station, Canadians, B.E.F.,
France, October 25, 1916.

To the Editor, ORAL HEALTH,

Toronto, Canada.

Dear Doctor Seccombe:

I remember you asking me shortly before we left Toronto for overseas to be sure and write you an account of what we were doing in the line of dentistry for the troops. I must apologize for the hopeless way in which I carried out your wishes. I intended writing time and again, but the ups and downs of this life certainly prevent one from doing what one wishes or intends to do. I am going to try and give you an idea of how dentistry is carried on in the various places we have been.

After arriving in England I met Drs. Lough and Atkey busily engaged in dentistry for all the troops, practically, in the Shorncliffe area. I joined them for a few weeks, and we certainly worked hard. The first draft of Dental Corps (organized since we left Canada) arrived with a large number of dentists and mechanics, and through Lieut.-Col. Armstrong we were taken on their strength and given commissions. I was sent to St. Martin's Plains; Lough and Atkey remaining where they were.

In our clinic we had four officers, a large number of mechanics, and a very good laboratory. The demands made upon the corps necessitated an increase in both staffs to handle the work properly. From time to time the personnel of these clinics was changed, men being sent to France and new drafts arriving from Canada. Shortly before I left Captain E. D. Madden came and took charge of St. Martin's Plain clinic and laboratory.

I came over to France about nine months ago with No. 3 C.C.S. Can., and have been working for British troops only, except the men in this unit.

There is a great difference in the work for Canadians and British troops. The Imperials, having no dental corps, the dentists are attached to the R.A.M.C. at clearing stations and base hospitals. They are not attached to field ambulances at all, as in the Canadian service at the present time. A British soldier, to receive dental treatment, first reports to his M.O., who sends him to the field ambulance, which collects the dental patients for that particular division. From there they are sent to the casualty clearing station doing the dental work for the division. By this arrangement one dentist is supposed to look after about twenty-two thousand men. Since coming here I have worked for three different divisions, including the famous Guards. I should say the condition of their teeth was 60 per cent. better than the others. The Canadians better still.

For prosthetic work the men have to be sent still further, to a stationary hospital, because the dentist at the C.C.S. is not equipped to do that kind of work. Upon my suggestion it has now been arranged here that three of the clearing stations in this area will each do work for a division; another will work for officers only, and I am to do the laboratory work for the three divisions coming through these stations. This will mean a great saving in time. By the other arrangement a man was often lost to his battalion altogether.

The number of extractions and plate work necessary for the British troops surprised me. The British dentist over here averages about one thousand extractions a month. One of my monthly reports is as follows:

Extractions	675
Fillings	289
Repairs	89
New Dentures	93
Sundries	283
General Anaesthetics, cases	14

My laboratory staff was two mechanics.

I must thank you for copies of ORAL HEALTH, which I appreciate very much. I receive them quite regularly. Have been in the best of health since leaving Toronto and enjoy my work very much. Would like to drop in and see my old friends in Toronto, but am afraid I will have to wait some time for that.

Give my best regards to all and yourself.

Yours very sincerely,

J. W. McDONALD, Capt.,

D.S., No. 3, C.C.S., Canadians.

AN INTERESTING LETTER FROM CAPT. CAMERON.

Somewhere in France,

Editor, ORAL HEALTH.

October 31st, 1916.

Having read in the Montreal Star, dated September 16th, 1916, a resume of two papers read before the Canadian Dental Association, on the dental work done for soldiers at the front, I feel that if the newspaper reports are the facts which were put before the members, it's only fair that they should be put in closer touch with what the actual conditions are.

As you know, there are three dentists to a Division, not counting dentists at Casualty, Clearing and General Hospitals. The three men are attached to Field Ambulances, but it does not always follow that they remain at their respective headquarters. Then there are also three corps dentists.

Last year, during the winter, there was a dental officer located exactly a mile and a half from the front line. Now this was considered a pretty easy berth, because the men, unless suffering pain

from their teeth, would prefer to wait until they got back into rest. The busy spot for the dentist is back at the rest camp.

The distance of these camps from the front vary according to different parts of the line. Later on we changed our location on the line and had another Advanced Station where dentistry was carried on for about four months. This location had to be changed, due to excessive shelling. One direct hit was made on this place but fortunately was a dud. I had my office for a while located right near a cross-road. We all knew the Germans had the range on the spot.

One day an observation balloon came and located about 200 yards from us. Needless to say we knew sooner or later it would draw fire. We did not have to wait long,—one evening they (the Germans) sent over seven shells which resulted in about fifteen casualties. The balloon shifted and there was peace and quietness.

I might say that although not in a position to make an official report on amount of work done, the number of men sent back to the base on account of teeth is NIL. This ought to enlighten the members of the C. D. A. that there are dentists with the boys right up at the line and not at the base, as stated in newspaper report referred to.

Another essayist refers to not officially being able to get aid from the "Red Cross."

After my experience of working out here for thirteen months I can't figure out where their assistance is needed. We are not in the least stinted with the necessary supplies to carry on our dental duties.

It's kind of humorous to read in the dental magazines where it is advocated by some, to see at the most seven patients a day. During our busy season, or any time, seven a day is a pretty easy day's work.

I am sure it would be very interesting to see some of the places where we have had to work,—kitchens, barns, under the shade of trees, bell-tents, chateaus, bedrooms. Then on two occasions the engineers put up huts made mostly of tar-paper. However, they were very comfortable in the warm weather; am thankful to say, however, that we have not got to carry-on in them for the winter. At present my office is on the second floor of a tower in a chateau. Every morning when I go to work and look up at the window it makes me think of the stage setting in "Il Trovatore" where they pull off the swell duet.

The boys are always very grateful for the work we are able to do for them, and that in itself more than repays us for our efforts.

GEO. S. CAMERON, Capt.,

C. A. D. C.,

No. 6 Canadian Field Ambulance, B. E. F.

P. S.—I wish to thank you very much for the copies of "ORAL HEALTH," which I enjoy reading immensely and helps me to keep in touch with what is going on in the dental world.

ORAL HEALTH

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Vol. VI.

TORONTO, DECEMBER, 1916

No. 12

EDITORIAL

1917—What

THE dying hours of the old year are upon us once more. As we approach the new year, we unconsciously turn our backs upon the old shattered hulk of the year that is gone, and with hope and courage "press forward to those things that are before." In spite of the sorrows and horrors of the past year, hope rises eternal; and though we may see storms and heavy weather ahead, yet we are also able to discern a silver lining to the cloud.

The Christmas season is upon us, and it is for each to resolve once more to work into his daily life a little more of the Brotherhood of Man—not the brotherhood of race or creed—but the brotherhood of man as exemplified by the life and works of Christ. The day when any man or any nation can live unto itself is gone. We are members of a brotherhood. Let us uphold the ideals of that brotherhood—not only to *fight* for them, and if need be, *die* for them, but also to *live* for them. Thus may each be worthy of his citizenship.

Let us make 1917 a year of *real* progress.

Dental Clinics in School Buildings

THE most important phases of the health problem are educational in character. This fact is recognized by every modern health officer. It is also recognized that health work must be carried on in the schools and that it is, indeed, one of the most important departments of public health effort. Some claim that the regular Health Officer should have charge of this department of school work. Others, equally zealous for the best results, and anxious that co-operation should exist between teacher, physician and dentist, argue that this work should be in the hands of a special Health Officer working under the School Authorities. Both of these groups, though they disagree upon this point, are quite agreed that health instruction cannot be disassociated from school instruction and routine.

The Forsyth Dental Infirmary of Boston is certainly unique in its conception and operation. It has been a great boon, to the children of Boston and to the standing of Dentistry, both in the immediate community and far beyond. However highly one may regard the work of the Forsyth Institute, however, one should feel in no way bound to advocate a similar method as the ideal plan for all large cities. Neither should one sit in passive mood and do nothing for school children until some generous philanthropist comes forward, and makes a magnificent gift for the erection of a dental infirmary. Furthermore, the free discussion of other plans of organization and their comparison, should not be construed as a lack of appreciation of the really excellent work the Forsyth Institution is accomplishing.

A serious objection has been raised against the Forsyth Plan, namely, that it has been developed quite apart from the regular school system. The difficulty and expense of the transportation of children long distances to a central clinic and the probability of lack of permanent co-operation between teacher, parent and dental officer, where oral hygiene is not a part of the regular school work, makes the scheme of a dental clinic in every school building a much more practical plan. Such is the ideal to which the city of Toronto is working in its dental effort for the boys and girls of school age. Fifteen dental centres have been organized in as many schools, located throughout the city, and each is an integral part of the school organization. The school Dental Officers are subject to the same discipline, as to attendance, etc., as are members of the teaching staff.

In a recent issue of the *Scientific American* an article appeared under the title "Boston's Care of School Children's Teeth," in which the plans and work of the Forsyth Infirmary were described. The article also stated why the plan of a central clinic was considered an advantage over the establishment of a number of clinics distributed throughout the city. To quote:

"Unlike the medical practitioner, the dentist requires a complex equipment in order that he may work effectively. The multiplication of isolated dental units necessitates the duplication of many parts outside the chairs and the instruments of general application. Moreover, no form of professional activity offers more opportunities for the transmission of disease from one patient to another; hence the most rigid asepsis is an essential of dental work. A central plant, where the sterilization of everything that enters a mouth is under the control of an individual whose sole business this is, furnishes a more complete check on infection than the most conscientious divided effort in a multiplicity of small plants can possibly achieve.
.. On all grounds it is wiser and more practicable to bring the children to the dentist than to bring the dentist to the children. The child's time does not begin to be worth as much as the dentist's; and the element of time apparently lost to education can really be ignored, since it is repaid many times in the ultimate outcome."

The question is not the relative value of the time of a child compared with that of a dentist. It is rather a question of the value of the time of all the children the dentist works for. Under either plan the dentist wastes no time. It is just as easy for him to report at a given hour at a local point as at a Central Infirmary. The point is that we cannot hope to secure the cordial co-operation of school teachers, if the demands of oral hygiene compel the frequent absence of a number of children from school for extended periods, owing to the distance to be traversed in reaching a central clinic. This difficulty is reduced to the minimum by having the dental clinic situated in the school building.

Is there more danger of infection by keeping these children within the school and attending to their dental needs at the school clinic? Certainly not. If the school dental officer follows a correct technique and is an earnest, careful graduate, he will practise aseptic dentistry and there will be much less danger of infection than in assembling all the children of the city at a central point.

Sergt. G. H. Sloan Wounded

WORD has been received by Mrs. D. Sloan, Richmond Hill, from France, that Sergt. G. H. Sloan, who enlisted with the 40th Battery, has been wounded in the chest and is being sent to England. Sergt. Sloan was a dental student at the Royal College of Dental Surgeons before enlistment, and was president of the first year class. He went overseas a few months ago, and had only been in France a few months.

Two More Names Added to Honor Roll

ORAL HEALTH regrets the necessity of adding two more names to those who have already paid the supreme sacrifice in defence of world liberty. These are Pte. Harry Greenwood, of the 76th Battalion, and Gunner Oliver G. Dalrymple, of the 67th Battery. Both of these men were undergraduate members of the Royal College of Dental Surgeons of Ontario, and their memory will ever be revered by their fellow-students and associates in the Dental College.

Gunner Dalrymple was killed instantly while in action thirteen days after his arrival in France. He was a third year student, and popularly known through his football records.

The Royal College of Dental Surgeons of Ontario has given of its best to the work of the army in the present conflict, and this is particularly true of the undergraduate body, of whom there are upwards of eighty in khaki at the present time.

Dr. W. E. Cummer to Editorial Staff of Oral Health



DR. W. E. CUMMER.

ORAL HEALTH readers will be glad to welcome Doctor W. E. Cummer to the editorial department of the magazine; particularly so because of the increased importance attached to Dental Prosthesis, in which subject Professor Cummer is a recognized authority.

Modern dental thought accords first place to considerations of health in the practice of dentistry. Consequently many teeth that were formerly retained in the mouth are now necessarily extracted, and the problem of the hygienic replacement of lost teeth ever presents itself to the practising dentist with increased frequency and insistence. Under such circumstances it is specially interesting, and with sincere pleasure, that we announce the co-operation of Dr. Cummer in the editorial work of this magazine.

Dr. Cummer has been engaged in active dental practice for fourteen years, and for the past nine years has been Professor of Dental Prosthesis at the Royal College of Dental Surgeons of Ontario. Two years ago Dr. Cummer was also appointed Professor of Phy-

sics, as it was felt that his natural gifts specially fitted him to make practical application of physics problems to the practice of dentistry.

Professor Cummer has been fortunate in his association with many leaders of the prosthetic side of dentistry, including Drs. Snow, Gysi and Wilson. He has appeared before various dental societies, including the New York, Buffalo, Rochester, Winnipeg and Detroit societies. Dr. Cummer recently took a Western tour, upon invitation from societies, from Salt Lake City to Los Angeles, and subsequently conducted a post-graduate course at Richmond, Va.

Dr. Cummer's many duties have not interfered with his acceptance of an invitation to appear before the St. Louis Society during the present month. Truly the busiest men are frequently the ones most ready to serve.

The Canadian West and the Four-Year Course

HERETOFORE there has been available to Canadians living in the Western Provinces of Canada opportunity of attending any one of a number of dental colleges, conducting a three-year course, and in comparatively close proximity to their home district. All the Canadian dental colleges have maintained the four-year course for the past years, and in this respect have appeared, to the prospective student, at a disadvantage compared with the three-year schools.

Reports from the West would indicate that one of the results of the lengthening of the college term to four years of all reputable schools will have the effect of bringing students east, thus enabling them, upon graduation, to practice in the Eastern Canadian province of their choice.

Important Correction

WE regret that a slight typographical error crept into the article by Dr. Merkley upon "Local Anaesthesia For the General Practitioner," which appeared in the October number of ORAL HEALTH. In the directions for intraosseous injection the decimal point was omitted, making the percentage solution to appear 5% instead of .5%. It would be wise for readers of ORAL HEALTH to make this correction in their October number so that there may be no possibility of future difficulty resulting from this error.

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